

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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**NCC Turns the Big Apple
Upside Down!**
Conference Preview
Follows Page 40

NCC '79 to Kick Off One Week From Today

NEW YORK — Bring your walking shoes — the National Computer Conference opens next Monday for what promises to be the biggest four-day show ever held here.

More than 50,000 people are expected to attend compared with a high of 35,000 here in 1976 and 57,240 in Anaheim, Calif., a year ago, according to the American Federation of Information Processing Societies (Afips), sponsor of the annual extravaganza.

A preview of events, the session schedule, exhibits and after-the-show attractions June 4-7 in the Big Apple follows Page 40.

NCC '79 will feature displays of equipment, systems and services from more than 490 organizations on all four floors of the New York Coliseum, spilling over onto the second floor of the New York Hilton and into the Sheraton Centre (previously the Americana) as well, where personal computer gear will be featured.

One regular exhibitor whose absence will be noted is Datapoint Corp. A company spokesman said he felt the exhibit hall was not worth the prices exhibitors were being charged. Bur-

roughs Corp., on the other hand, which has passed up NCC for many years in favor of the more specialized vertical industry shows, will return this year for a slice of the apple.

Technical Sessions

The technical sessions will also be divided among several sites. The conference program — comprised of more than 150 sessions, panels and tutorials this year — will be aimed at DP users and address the topics of management, applications, science and technology as well as focusing heavily on social implications of computing, Afips said.

Concurrently, three miniconferences — on financial transactions, law and public policy and health care — will be offered.

And a special series of 16 one-day professional development seminars organized by William A. Baker, assistant vice-president of Aetna Life & Casualty Co. in Hartford, Conn., will also be presented. These sessions are aimed at stimulating personal, managerial and technical growth. Each seminar costs \$50 and attendance is limited.

Personal computing has not been slighted either — the NCC '79 program boasts a separate festival with its own four-day program including 25 technical sessions plus applications, demonstrations and commercial exhibits.

The keynote address will be delivered at 10 a.m. on Monday, June 4, by IBM President John R. Opel. Other featured speakers include Charles P. Lecht, chairman of the board and president of Advanced Computer Techniques Corp., Rep. Charles P. Rose (D-

(Continued on Page 6)

OKs 'Enhanced Nonvoice' Services FCC Paves Way for ACS Approval

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The Federal Communications Commission (FCC) recently took a major step toward allowing AT&T to offer an unregulated combination of communications and DP services.

At a meeting May 17, the FCC unanimously accepted a proposal from its Common Carrier Bureau that common carriers be allowed to offer "enhanced nonvoice" data communications services through separate subsidiaries. The proposal would also allow carriers to offer sophisticated terminal equipment on an unregulated basis through similarly separate entities.

In adopting this "tentative decision," the commission said it would be flexible in determining how the separate subsidiaries should be established in order to preserve the advantages of vertical integration in the communications industry. To protect the public interest, new communications offerings could be examined on an "ad hoc" basis, leaving open the degree of separation called for in each case, the commission noted.

The first major recommendation from the commission's second Computer Inquiry, the proposal was described by Common Carrier Bureau Chief Larry Darby as a solution to the

increasingly difficult task of separating communications from DP services. The 1956 Consent Decree between AT&T and the Department of Justice does not allow AT&T to offer tariffed DP services.

Trying to distinguish between communications and DP in such complex proposals as AT&T's Advanced Communications Service (ACS) necessitates "a rigid and unsustainable" regu-

(Continued on Page 8)

IRS Change Means Rework of Payroll Jobs

By Marguerite Zientara

CW Staff

And Paul Gustafson

Special to CW

WASHINGTON, D.C. — The Internal Revenue Service (IRS) has an-

nounced new withholding and reporting requirements, effective July 1, that will necessitate major changes in most computerized payroll systems.

The changes call for employers to make advance Earned Income Credit

(EIC) payments to eligible low-income employees with every paycheck. Previously, an employee who earned less than \$10,000 a year and had a child living with him received an EIC on his annual tax return.

The Revenue Act of 1978 allows eligible employees to receive an advance on their EIC by filing the EIC Advance Payment Certificate, Form W-5. Employers will therefore have to include the advance EIC payments with wages paid after June 30 to eligible employees who have filed Form W-5. The IRS has issued wage bracket and percentage tables to determine the amount of the advance during the pay period.

In addition, employers will be required to enter the total amount of the advance EIC payments made during the year in Box 6 of the employee's 1979 W-2 form.

Estimates of the length of reprogramming time required for the changes at a

(Continued on Page 6)

Her Lucky Number

By Marguerite Zientara

CW Staff

WATERFORD, Conn. — On the very day that Karen Buckley received her first copy of *Computerworld*, she also received a phone call announcing that she was the newspaper's 100,000th paid subscriber.

While not fully believing the news, Buckley said it was "definitely a pleasant surprise." She is looking forward to a weekend with her husband at The Ritz Hotel in

Boston, compliments of CW.

A system supervisor at Aetna Insurance Co. here, Buckley entered the field of data processing after six years teaching music in public schools. "I decided I didn't want to do that for the rest of my life, and I wanted a new career," she said.

A large part of Buckley's inspiration to turn to DP came from her father, who has been in the business since the birth of the first generation of computers and who con-

(Continued on Page 8)



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Says 'No' to FBI Control Congress Bans NCIC Switching Buy

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Congress has once again moved to prohibit the establishment of what it fears could become a national police data bank.

For the second year in a row, the Senate Judiciary Committee has added a section to its annual Justice Department appropriations legislation that would prohibit the department from obtaining message-switching equipment for its computerized National Crime Information Center (NCIC).

The Federal Bureau of Investigation has sought permission since 1973 to operate a central message-switching center between state and local police agencies through the NCIC. Several members of Congress have steadfastly opposed the FBI proposal on the grounds that it might lead to FBI hegemony over state and local law enforcement authorities and would in effect make the bureau a national police force [CW, March 13, 1978].

The General Services Administration (GSA) is presently sitting on several FBI contract proposals for NCIC computer equipment that critics of the system fear would give the bureau message-switching capability, despite FBI arguments to the contrary.

GSA last year revoked Justice's authority to award those contracts or even to issue requests for proposals (RFP) for the equipment at the request of half a dozen senators and congressmen [CW, March 20, 1978]. The FBI is currently trying to get at least one RFP back on track.

Prohibitive Language

The Senate Appropriations Bill finalized May 15 specifies that none of the funds in the Justice Department's 1980 budget "may be used to purchase, lease or otherwise acquire message-switching equipment until such time as the Committees on the Judiciary of the House of Representatives and Senate have given their approval."

Similar language in the department's 1979 budget was removed at the insistence of the House of Representatives, but the FBI made no further attempt to

institute message switching because of the continuing opposition in the Senate.

It is thought that prohibitive language in this year's appropriations legislation will carry in the House because "it doesn't do any more than preserve the status quo, and basically it codifies the assurances that were given by the [FBI] director and the attorney general," according to Irene Emsellem, a senior staff member of the Senate Judiciary Committee.

During April 13, 1978 hearings before that Committee, FBI Director William H. Webster told the committee, "I give you my solemn assurance that we will not in any way implement message-switching capability without the knowledge and approval of the committee."

Hinges on OTA Study

Emsellem said Congress is not likely to take any further action toward approving the message-switching scheme until Congress' Office of Technology Assessment (OTA) completes its ongoing study of NCIC. The study is expected to be completed by the end of this year.

"The OTA study will be a comprehensive one that looks at not only the technology involved but also [at] the public policy questions," according to Emsellem. "They will not make a recommendation but will present arguments on all aspects so that the record Congress will consider in making its determination on NCIC will be fairly full at that point."

"There are a lot of policy decisions that have to be made with respect to the NCIC," she said.

"The main fear is that with respect to any kind of computerized system, the technology has a way of overshadowing the policy and then once the technology is in place, the policy questions don't get debated. So what we want to make sure of here is that the policy is firmly established with the technology plugged into that, so we don't have a lot of investment in technology which may be inappropriate or [have to] be dismantled."

According to Emsellem, Congress is trying to reconcile its concerns with the FBI's needs. "What we have to do is see if there is an accommodation between the two approaches."

In the meantime, the FBI is trying to remove some of the taint of message switching from its request to GSA for authority to procure what it says is badly needed DP equipment. In an April 26 letter to Sen. Edward M. Kennedy (D-Mass.), chairman of the Senate Judiciary Committee, FBI Director Webster asked the senator's assistance in obtaining "A desperately needed communications controller" to be "the interface between the NCIC computer and dedicated communications lines which link it to criminal justice agencies throughout the country."

The function is presently performed, Webster said, by a "1965-vintage computer which is technologically outdated, operationally overextended and unable to cope with the constantly increasing use of the NCIC system." This is the equipment whose RFP ran into trouble last year because it carried a cover letter requesting bidders to include message-switching proposals even though the bureau did not have authority to install message switching.

GSA's Automated Data and Telecommunications Service (ADTS) subsequently recalled the RFP and no further action has been taken on it. Following Webster's letter to Kennedy, the FBI arranged for a meeting scheduled for last Thursday of the FBI and the Judiciary Committee to see if the bureau could get Senate approval to acquire the communications controller.

Certain Judiciary staff members feel the controller could be subverted to message-switching functions. However, it is also generally conceded that the FBI already has the equipment capability to perform message switching if it so desires.

Frank Carr, ADTS commissioner, told *Computerworld* last week it is really a question of how much work the FBI would be willing to put into reconfiguring its hardware and how badly it might want to institute message switch against the will of Congress.

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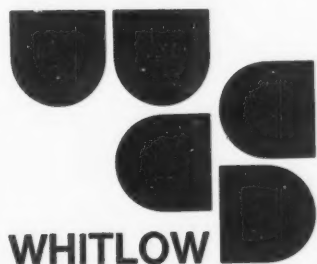
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Blackout Puts Boston Area Users Days Behind

By Brad Schultz
CW Staff

BOSTON — A power blackout froze DP operations in parts of the Boston area last week, leaving some users days behind in their work schedules and at least one large user with damaged hardware.

DPers told *Computerworld* they were hurt most by the work delays. Few of those polled lost data, though a number were running programs when the blackout hit them at 7:25 p.m. on Monday, May 21.

Caused by a utility substation fire, the cutoff to 40,000 Boston Edison Co. customers lasted through the night in Boston's Allston, Brighton and Roxbury districts, in adjacent Brookline and in portions of neighboring Watertown and Newton. The blackout caused power fluctuations in Cambridge and other cities served by utility firms linked to Boston Edison in a "power grid."

Early Tuesday morning, Boston Edison reportedly told a large installation serving hospitals and medical research units that it would receive some power in a test that could not harm equipment. A surge of power then came through the line, destroying mainframe cooling fans and nearly "cooking" the entire configuration, according to a spokesman for that user, which asked not to be identified.

'Resurrected at Noon'

The blackout created "environmental problems" for the facility that supports the *Christian Science Monitor*, according to Gene Madden, DP manager of the First Church of Christ Scientist. The church uses a 768K-word Digital Equipment Corp. Decsystem-1077 to fill *Monitor* subscription orders.

Without current, the computer room's heater did not work Monday night, leaving the room too cold to permit a system restart Tuesday morning, Madden explained. The 1077 was finally resurrected at noon, several

NRC Closes Pilgrim I Plant

BOSTON — The blackout of Boston Edison Co. customers occurred just two weeks after the utility lost a major source of its electricity by voluntarily closing a nuclear plant in Plymouth, Mass.

The Nuclear Regulatory Commission (NRC) will not allow Boston Edison to reopen its Pilgrim I plant until structural weaknesses in computer designed piping have been resolved, an NRC spokesman stated. Boston Edison's own computer fa-

cility went down during a blackout several weeks ago that affected a number of major office buildings in downtown Boston.

Touched off by a subterranean cable fire, that blackout kept Boston Edison's IBM 370/158 down for several minutes, according to the utility's DP manager.

The IBM mainframe has no uninterruptible power supply, another spokesman confirmed.

hours after current had returned, when the room temperature topped 65°F.

The blackout caused the facility to fall about a day behind in its work schedule and may prompt the church to acquire equipment that can bridge power interruptions or at least minimize their effects, Madden said.

Hospital Falls Behind

DP operations at Boston's Beth Israel Hospital fell a week behind because the blackout idled its IBM 370/125 and two Data General Corp. Eclipse C/330s for six hours.

Beth Israel DP Manager Robert Messier considers blackouts a "routine problem" for Boston Edison customers. He said he did not try to restart his systems immediately after current returned, knowing that power surges through lines at thousands of volts above normal when a blackout ends.

However, Beth Israel's systems run billing and accounting applications at virtually top capacity in batch mode, making "catch-up" efforts extremely difficult, Messier observed. This time around — just a few weeks after the last Boston Edison blackout — Beth Israel lost no data, but did have several programs running when the power failed.

Like most modern hospitals, Beth Is-

rael can rev up its own reserve generators in emergencies. But Beth Israel lacks uninterruptible power supplies (UPS) which, in conjunction with other equipment, allow a CPU to accept reserve power and withstand surges when commercial power returns.

Messier does not think the hospital can justify buying a UPS, which typically costs \$20,000.

Insurance Firm's Realization

Despite that high price, an insurance firm near Boston may buy a UPS to secure its 512K-byte IBM 370/145 after losing a week's worth of DP in the blackout. Execution of an important program had just begun when the lights went out, nearly destroying valuable data, a spokesman said. The mainframe was down for eight and a half hours.

Like Beth Israel, the insurance firm — which also asked that its name be withheld — has a history of problems with Boston Edison. However, the firm has only recently recognized that fluctuations, reductions and breaks in current have disturbed its DP.

In the past, the company troubleshooted mysterious crashes of the 370/145 with software debugging and system diagnostics. "Now we call Boston Edison when [the system fails] and ask

whether anything funny is happening in our area," the spokesman said.

Harm Avoided

Power fluctuations are known to introduce read/write errors. Sustained reductions, sometimes imposed by utilities as a means of rationing electricity, significantly reduce a typical — unprotected — system's uptime [CW, May 7].

Edmund J. Carroll of Brookline Trust Co. has seen printed circuit boards "fried" in power surges, so he waited a while after power returned to the bank before restarting its IBM System/3 Model 15. Primarily used to process checking and savings account transactions, the minicomputer was idled six and a half hours by the blackout.

No data was lost, and Carroll said only two hours were needed to catch up with his work schedule.

The blackout whisked away one set of data at Harvard University's Health Services computing facility, where several programs were running at the time. But the information was recovered from a backup magnetic tape, according to Dr. Ray Neff, the facility's director.

Magnetic tapes of program listings, output and associated data are made routinely for just this reason, he pointed out.

For scientific research support, the facility maintains two DEC PDP-11/70 superminis with 512K and 192K bytes of main memory and a 160K-byte PDP-11/34. Neff said those systems do not feature UPS and are thus vulnerable to damage caused by surges.

Praise From Some

Some users had high praise for the way their systems weathered the blackout. Jack Shea, operations manager with the Town of Brookline's Information Services Department, felt "very secure" with his Hewlett-Packard Co. 3000 Series III.

A battery-driven data-save option on the 384K-byte system gave the department 30 minutes to effect an orderly shutdown. The HP 3000 runs jobs ranging from real estate tax billing to recording the grades of Brookline schoolchildren.

Boston's Affiliated Hospitals Center averted head crashes on its IBM 3330 disk drives when the center's 2M-byte 370/158 lost power. A spring-loaded feature on the drives allowed their heads to drop away gently at the blackout's onset and then lift back onto the disks when power returned, according to Walter Kane, systems director.

"It saved the whole hospital," he said. A UPS is presently on order.

The blackout started when two circuit breakers tripped simultaneously at Boston Edison's Brighton substation. The failure of the circuits caused wires to spray sparks that touched off a small fire, a spokesman for the utility said.

According to the spokesman, power returned to most of the stricken customers by 11 p.m. Monday and to the rest by 5 a.m. Tuesday. Boston Edison's blackout caused power fluctuations well outside its service area because — to minimize the effect of blackouts — Massachusetts law requires adjacent utilities to link their resources in a power grid.

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Gays Angered by White's Sentence

DPer Flee Rampaging Crowd in San Francisco

By Jeffrey Beeler

CW West Coast Bureau

SAN FRANCISCO — Personnel and hardware in this city's DP department narrowly escaped disaster last week when several hundred enraged demonstrators went on a nighttime rampage that left scores of combatants injured and much of the downtown Civic Center littered with scorched debris.

At the height of the outburst protesting the manslaughter conviction of former city supervisor Dan White, several rioters smashed windows in the City Hall basement, which houses the municipal DP department, and hurled makeshift torches into the administrative offices below.

The assault on the computer center loosed a hail of jagged glass fragments and triggered several small trash fires, the most serious in the office of Henry Nanjo, DP department head. Firemen quickly extinguished the blazes, however, before they spread down the hall to the city's computer room, which houses two 6M-byte IBM 370/158s plus 52 IBM 3330- and 3350-type disk units storing a total of 8G bytes.

None of the center's hardware modules, including an assortment of 40 CRT terminals, sustained any damage during the fracas. Except for the broken windows and some minor fire damage to the administrative offices, the incident left the DP department virtually unscathed, according to assistant director Tom Gerughty.

"We were damned fortunate," Gerughty observed, a wide smile of relief spreading across his face. "It could have been a lot worse."

In addition to serving as the DP arm for the city's courts, police, hospitals and other social services, Gerughty's department plays a key role in preparing the municipal budget, on which local officials are currently hard at work. If last week's attack had resulted in any serious damage to the computer center's facilities, efforts to complete the city's budget "would have jammed up for sure," Gerughty said.

Of the five computer room technicians and 20 data entry specialists on duty the night of the riot, none reported any injuries, although most may have gotten the fright of their lives.

"We were scared s---tless," shift supervisor John Russo admitted the following evening, "but everyone stayed pretty calm. I knew I couldn't run around like a chicken with its head cut off because the whole group there would have panicked."

Triggered by Jury Decision

The attack on the city's DP center and other Civic Center sites came just hours after a jury of seven women and five men found White guilty of manslaughter in the Nov. 27 shooting of Mayor George Moscone and supervisor Harvey Milk, an admitted homosexual.

Outraged by what they considered an unjustly lenient verdict, an estimated 500 members of this community's large gay population assembled in the Castro St. area for a nonviolent protest march from Market St. toward City Hall. The demonstration started peacefully enough, but as the ranks of pro-

testers swelled, so, too, did their rage and frustration.

By the time the crowd reached the steps of City Hall, its passions had heated to a fever pitch and finally boiled over in an orgy of violence and destruction.

While most of the 5,000 or so demonstrators watched in shock and disbelief, an estimated 200 to 300 ripped signposts and parking meters from concrete foundations and stormed City Hall. Using their makeshift weapons as battering rams, they smashed almost every first-floor window on the Polk St. side of the domed, Grecian-styled building.

They then vaulted a low wall ringing

the base of the structure and leaped into a dry moat guarding a row of basement windows. Once in the moat, the vandals used garbage cans and other available weapons to punch basketball-sized holes in the DP center's reinforced basement windows.

Unable to completely shatter the glass and invade the administrative offices below, the attackers tossed burning shrubbery and rubbish through the battered panes and started several small fires that produced more smoke than flame.

With glass splinters flying and the sounds of mayhem ringing in their ears, members of the municipal DP department bolted from their administra-

tive offices, fled to the windowless computer room and locked the unmarked door behind them. They remained there for several tense hours while chaos and destruction raged around them.

No evidence from the assault suggested the rioters singled out the DP department as a special target or that they even knew of the computer center's existence. Instead, the attack appeared part of a nightlong pattern of indiscriminate violence in which protesters laid siege to anything and everything in sight.

Meanwhile, in the streets, helmeted police wielding nightsticks joined the

(Continued on Page 6)

Would You Really Rather Drive a '58 Detroit Monster...

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FBI Nabs Two in Transfer Of \$1.1 Million From Bank

By Marguerite Zientara

CW Staff

LOS ANGELES — The Federal Bureau of Investigation has arrested two men and charged them with the illegal transfer of \$1.1 million from City National Bank in Beverly Hills last March.

Michael Joseph Kelley, 27, a former City National Bank secretary, was arrested May 14 in Fort Lauderdale, Fla. Richard Albert Warren, 38, was arrested two days later in Miami, according to Tom Sheil, FBI special agent.

Out of 15 diamonds the two allegedly bought from a New York City diamond dealer with the transferred money, the FBI has confiscated 11 gems valued at \$825,000, Sheil said.

Kelley and Warren were charged with "fraud by wire" in a complaint filed by the FBI on March 21. According to FBI accounts, Kelley allegedly wired \$100,000 from a business account at City National Bank to Warren's account at Chase Manhattan Bank in New York City on March 13.

Two days later, Kelley reportedly caused a \$500,000 transfer to be wired from another City National Bank business account to an account at Chemical Bank in New York. Friday, March 16, Kelley's

last day of work at the bank, an additional \$500,000 was transferred.

The bank discovered the transfers the following Monday and reported them to the FBI which, "through good investigation," located the pair in Florida, Sheil said. Kelley allegedly spent the entire \$1.1 million on diamonds, four of which remain to be recovered.

At press time, both Kelley and Warren were in custody in Fort Lauderdale in lieu of \$1 million bond. A removal hearing was scheduled for last Friday before the U.S. Magistrate to determine whether they are the individuals named in the original complaint and whether there is probable cause to believe they committed the crime. The hearing's outcome was to dictate whether the pair was to be returned to Los Angeles to face criminal charges.

As for details concerning the successful breach of bank security and the actual method of transfer, "I doubt whether the bank or the FBI will go into any detail on something like that," Sheil remarked. "We have enough problems as it is without advertising how to do it."

City National Bank spokesmen were unavailable for comment.

IRS Change Means Rework Of Payroll Applications

(Continued from Page 1)

medium-size installation generally approach a man-month, "depending on what you've got to work with," according to Larry Munini, manager of program products at Wang Laboratories, Inc.

"There are some tricky mechanisms involved," Munini said. In addition to figuring the exact payment for each employee with every paycheck, "you have to keep track of all this data so you can report it accurately on a W-2 at the end of the year."

A master file conversion would be necessary to expand a system that had no room to keep a separate accumulator. Munini estimated that if a programmer salaried at \$24,000 a year spent a month on the project, the cost for the change would amount to about \$5,000 in the area of reprogramming alone.

A company might conceivably have to throw out its supply of payroll checks and start anew if its present checks have no room for the new data on the check stub. "If you've used up every print line [on the checks] and you don't have any more room, you're in a lot of trouble," Munini said, "because you have to expand it all and reprogram that whole printing. Most people don't have that kind of expansion on their systems."

In discussing the changes his firm has made so far, Lou See of Florida Software Services, Inc. noted that out of 26 hard-coded programs in its system, five programs have had to be changed for reporting purposes.

Three programs remain to be changed as soon as the federal government releases the necessary specifications, See noted. Those programs are the employer's Form 941 report and 941A printout and the employee's W-2 form.

The forms must carry quarter-to-date figures for the 941 Fica report, and yearly basis figures for Box 6 of the W-2. The EIC payments "cannot be carried in overall year-to-date gross because [they are] not income to the employee per se," See stated. "It is a grant, in a manner of speaking, from the federal government on a payroll period at a certain percentage rate, depending on how many certificates are filed."

"The coding involved in ours is in the neighborhood of about 1,700 lines of physical code," he said. "Our master file had to be changed to carry the year-to-date and quarter-to-date figures and the indicator to indicate how many certificates are filed."

Changing 11 of 26 Programs

When Florida Software Services has finished reprogramming, it will have changed 11 of its 26 programs for the W-5 information, according to See. "We had to alter our edit programs to edit the codes coming in, and we had to initialize the quarter-to-date and year-to-date figures to be carried forward with a new employee," he said.

"We also had to allow for master file update of the code, master file update of year-to-date and quarter-to-date figures, as well as a pay period update of the year-to-date and quarter-to-date figures. We also had to pass the figures to the check program to be printed, to the 941 program for the quarterly report, to the 941A for the Fica report and to the W-2."

See said Florida Software has spent "about two weeks at eight hours a day, working two men" on reprogramming efforts, including coding, testing and documentation changes.

In short, "we've done everything so that when we send [our payroll package] out to our buyers, the people who have purchased [it] and are going to be updated under our contract will be able to implement it without a serious problem of any kind."

Gustafson is product manager for Argonaut Information Systems.

NCC Kicks Off Next Week

(Continued from Page 1)

N.C.), Dr. Willis H. Ware of The Rand Corp.'s Corporate Research Staff and Dr. Portia Isaacson, EDS Fellow, Electronic Data Systems Corp.

Other NCC '79 highlights will include a computer stamp exhibit, a science film theater; finals of the Amazing Micro-Mouse Maze Contest, a tribute to Cobol on Pioneer Day and an all-conference reception on Monday evening, June 4, from 6 to 8 p.m.

A special one-hour TV program will be aired each morning at 7 a.m. and again at 8 a.m. in most conference ho-

tels to preview that day's events for the convenience of show visitors.

For \$75, attendees get four days of conference sessions, four days on the exhibit floor, a copy of the proceedings and entry into the Personal Computing Festival.

Twenty-five dollars buys one day's entry to the exhibit floor and attendance at any of that day's conference sessions or a four-day admission ticket to the exhibition.

Four days at the Personal Computing Festival along with a copy of the proceedings costs \$15; one day costs \$5.

DPers Flee Disaster in San Francisco Riot

(Continued from Page 5)
fray, which soon after escalated. Demonstrators overturned an unoccupied van belonging to a television news crew, torched 13 patrol cars and met

police in sometimes fierce hand-to-hand combat that left 65 officers and 75 civilians — some of them innocent bystanders — injured.

City supervisor Carol Ruth Silver ap-

peared on the scene in a vain attempt to pacify the incensed crowd, but her effort stopped short when a chunk of flying rock struck her in the face and knocked her to the ground. Though not seriously hurt, Silver suffered a bloody gash above her lip and was taken to a nearby hospital for treatment.

As the night wore on, rioters turned their fury from City Hall to the nearby State Building, where they smashed more first-story windows and poured into adjoining neighborhoods to assault three banks and ransack private businesses.

By 4 a.m., however, the violence had subsided enough for the relieved, but still shaken, DP staff to emerge from their hiding place and begin the arduous task of repairing the damaged administrative offices.

Seven hours later, most of the cleanup was done, although the DP center windows still showed gaping holes and the strong smell of scorched rubbish still hung in the air.

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IBM Witness Rebuts Damaging Testimony

By Jeffry Beeler

CW West Coast Bureau

SAN FRANCISCO — IBM called a long-time user to the stand recently in an apparent attempt to discredit the damaging testimony of International Data Group Chairman Patrick J. McGovern, who appeared earlier in the Transamerica Computer Co. vs. IBM antitrust trial.

Under questioning from IBM attorney Robert Draper, University of Michigan Computing Center Director Aaron Finerman credited the computer industry with giving users a steadily growing range of equipment options during the past six to eight years.

Finerman's testimony conflicted with McGovern's, which portrayed the mainframe business as an industry with harrowing market entry barriers and a progressively shrinking field of competitors.

In addition, Finerman disputed the popular argument that software conversion costs pose a major obstacle to users wishing to switch from one CPU manufacturer to another. McGovern, in contrast, described software conversion as painful and extremely expensive, citing the procedure as one of the chief barriers to newcomers trying to break into the computer field.

Minis: Dedicated or Not?

In other rebuttal testimony, Finerman challenged McGovern's characterization of the Digital Equipment Corp. PDP-11/45 and the Modular Computer Systems, Inc. models 2 and 4 as dedicated application computers. "As I understand that classification scheme, it describes all minicomputers as dedicated application machines, and I don't understand that rationale," he said. "It's not one that makes sense to me."

Instead, Finerman classified the DEC and Modcomp CPUs as general-purpose products. "There's not much doubt about that," he asserted. "I'd have to rewrite history if I said otherwise."

Although Finerman agreed with McGovern's observation that the ranks of IBM's competitors have steadily dwindled, he credited the few remaining rivals with offering an unprecedented assortment of reliable hardware. "My range of alternatives as a user and a manager is significantly stronger now than it was several years ago," according to Finerman, who in addition to his other duties serves as a computer science professor at the University of Michigan.

Plug-compatible disk and tape system makers like Memorex Corp., Storage Technology Corp., Ite Corp. and Control Data Corp. "are strong companies," he said. "They are really offering me alternatives. They are really competing."

On the subject of software conversion, Finerman sounded another note undoubtedly helpful to IBM's case. "I don't think software conversion has served as a barrier to changing equipment," he maintained.

Conversions are an inevitable part of computing, he explained, because most users eventually reach a point where the cost of continually revising and updating their software exceeds the expense of acquiring a new package.

"In my experience and opinion, there always comes a time when you say 'I

now must make a change,' and included in that change is the problem of conversion," he said. In fact, "there have been instances where it's easier to go from IBM to some other manufacturer" than to convert from one IBM system to another.

Users of IBM 1401s, for example, found they could convert "much easier" to a Honeywell, Inc. 200 than to a member of the 360 series, primarily because the 200 ran 1401 programs while the 360 line did not, Finerman recalled.

Transamerica attorneys responded to Finerman's testimony by repeatedly challenging the computer science professor's DP expertise and quizzing him about his past relationship with IBM.

Under cross-examination by Trans-

america lead attorney Richard Lucas, Finerman confessed complete ignorance about several DP matters that Lucas clearly believed any informed user should know. When asked to estimate the typical price difference between main memory and disk storage, the witness replied, "I don't know." That was the same response he gave previously during deposition when asked to identify an IBM 3420.

Finerman also admitted ignorance of many DEC PDP-11/34 technical specifications, including the type of main memory the processor supports, its memory cycle time and the disk and tape system models it supports.

In other cross-examination, Lucas forced Finerman to admit that IBM had paid him \$55,000 before October

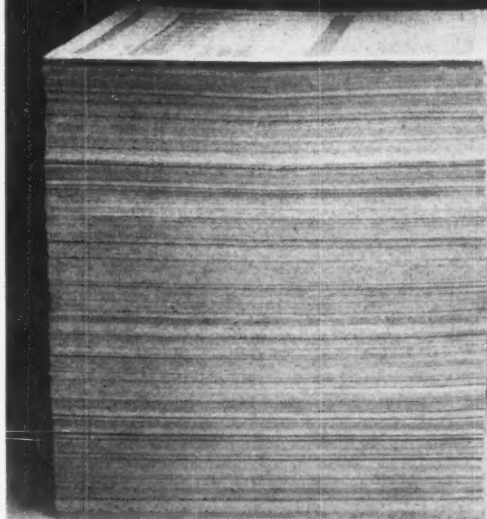
1978 and \$25,000 since then for his work in helping defense attorneys prepare their case against Transamerica. Further questioning revealed that as a representative of the IBM World Trade Association, the witness received \$250 to \$300 per day plus expenses from IBM while traveling extensively to the Mideast, Western Europe, South America and Asia.

During redirect examination, however, Finerman denied any favoritism toward IBM. "Has the fact that you've traveled — and that some of these travels have been paid for by IBM — influenced your testimony in any way?" Draper asked.

"Not in any way, shape or form," Finerman replied.

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FCC Approves Proposal Paving Way for ACS

(Continued from Page 1)

latory structure, Darby told the commission. He urged that the "present archaic scheme" be scrapped in favor of a more "forward-thinking" regulatory methodology.

Three Service Groups

The plan approved by the commission would divide all network services into three groups:

- Voice services, or traditional telephone services.
- Basic nonvoice services, which consist of transmission only, described by Darby as "pipeline services."
- Enhanced nonvoice services, which would make use of DP applications to act on form, content, protocols and other parts of the transmission.

Carriers offering enhanced nonvoice services would have to set up subsidiaries separate from the corporate entities providing the underlying transmission facilities. The new services would be offered on a resale basis, and the computer equipment of the underlying carrier could not be used for the resale offerings.

As for terminal equipment, the scheme would allow carriers to offer tariffed "basic media conversion devices," such as telephones, in voice and

basic nonvoice services. More sophisticated equipment could be offered on an unregulated basis for a carrier's enhanced services.

Although "historically we have attempted to rely on antiquated accounting methods" to prevent carriers from cross-subsidizing competitive services with revenues earned from monopoly offerings, "we are coming to increasingly regard . . . separate subsidiaries as an important regulatory tool," Darby said.

The Common Carrier Bureau has become "skeptical" about its ability to develop the cost-accounting methods needed to protect the public from cross-subsidization, he continued. "If we go the accounting route," it becomes a "hands-on, day-to-day operation."

If separate subsidiaries are called for, the initial corporate restructuring mandated for the enhanced communications offerings would be the bulk of the commission's regulatory burden,

he pointed out.

Commissioner Joseph R. Fogarty, did not find "one scintilla of evidence in the record to support the concept of separate subsidiaries." The FCC has never investigated the proposal to see whether it is in the public interest, he said, pointing out that Congress has backed away from calling for separate subsidiaries in the Communications Act rewrite legislation now being considered.

Darby's "healthy skepticism" about the efficacy of regulation through accounting systems is not a valid legal basis for the new proposal, Fogarty said, terming Darby's argument "a cop-out." The commissioner voted for the proposal in the end, but not before being assured that the notice of inquiry that accompanied it would solicit public comments and suggestions on this point.

FCC Chairman Charles D. Ferris pointed out that the commission would not be relinquishing responsi-

bility for overseeing the accounting methodology of carriers. That activity would continue after any subsidiaries are established, he said.

The proposal merely provides a "base line" for distinguishing between communications and DP services, a task the commission is called upon to perform, he noted.

Allaying Fears

Ferris agreed with Darby that with the increasing merging of communications and DP technologies, accounting systems are not sufficient for making that regulatory distinction.

Addressing the subject of the 1956 Consent Decree, Ferris said the commission could proclaim the DP services offered by AT&T through an approved enhanced nonvoice subsidiary to be incidental to communications.

That, he ventured, would allay any Justice Department fears about AT&T's entry into the DP market.

Lucky Subscriber Becomes CW's 100,000th

(Continued from Page 1)

siders himself a pioneer in the field, Buckley said. While she was not exposed "in any educated sense" to DP as she grew up, she was still aware of the field as a potential career source.

Her first DP job was as a programmer trainee at Aetna. She worked her way up through the ranks to her present position, which she has held for the past three years. As a system supervisor, Buckley now supervises programmers in a maintenance and production environment.

"I have never regretted the decision" to switch from music to DP, Buckley said. She does not see much similarity between the two fields: "I've always heard that people have done studies showing that musicians make good programmers, but I've looked for correlations and can't find any."

Asked whether she had any interest in computer-generated music, Buckley remarked, "I can't believe [such music] would be anything very artistic."

Karen Buckley isn't the only one who's pleased with the turn of events. According to Margaret Phelan, CW's vice-president of circulation, the 100,000th subscriber is the culmination of "11 years of hard work. It's taken a long time to get there, and I think it's pretty great."

Phelan felt the milestone was significant for two reasons. First, the 100,000th subscriber is a woman. While the figures are not precisely known, the percentage of female subscribers is somewhat smaller than the percentage of male subscribers.

Second, the 100,000th subscription was not company-subsidized, but was paid for with a personal check. The subscriber "is someone who thinks enough of the paper to pay for it out of her own pocket," Phelan said.

Vote of Confidence

Since Buckley sent in her fateful payment using a "bind-in" envelope, furnished in each issue of the paper,

she evidently was a "pass-along reader," Phelan remarked.

It all adds up to a "vote of confidence for CW's editorial quality," according to Phelan. "We never would have reached 100,000 in paid circulation if readers did not feel the editorial quality has been as good as it has been for the last 12 years." In addition to editorial quality, Phelan cited the publication's frequency — "51 times a year vs. 12 times for a monthly" — as a contributing factor in attracting 100,000 subscribers.

Finally, success in getting the paper to subscribers every Monday is another reason for CW's high subscription rate. Delivering the paper "is a pretty horrendous task," Phelan said, "especially with today's transportation problems."

With a steady annual growth rate of 8% to 10%, CW now looks forward to the 200,000 mark, and another lucky subscriber can look forward to a weekend at The Ritz.

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headline, *Computer World*, May 7, 1979

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NEW YORK — The Association for Computing Machinery (ACM) has "unbundled" its publication subscription fees from its membership dues.

Until now, members have received ACM's monthly flagship publication, *Communications of the ACM*, combined with a subscription to the *Journal of the ACM*, *Computing Surveys* or a credit toward *Computing Reviews* as part of their \$35 annual dues.

Members will now pay \$28 in annual dues and receive *Communications* as usual. They may subscribe to any of the other six major ACM periodicals at the same member rates as before.

Dues for student members will be reduced to \$9 from \$11. Students will also continue to receive *Communications* and may subscribe to the *Journal* or *Computing Surveys* for an additional \$2.

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Yankee Group President Says Electronic Mail's Boon? Fewer Phone Calls

By a CW Staff Writer
HOLLYWOOD, Fla. — The biggest promise of electronic mail is that it will cut down on the time wasted on phone calls, according to Howard Anderson, president of The Yankee Group.

Speaking at a recent conference here, Anderson called the phone call "the most important impediment to office productivity. The biggest benefit of installing an electronic mail system is that the phone stops ringing."

With one of today's electronic mail systems, a user will probably pay about 75 cents per message. While such systems are not perfect, Anderson advised users against trying to customize a computer-based mail system because the costs are too great.

Despite their promise, electronic mail systems are still encountering massive resistance. Some of the resistance stems from the fact that executives are not skilled in keyboarding, Anderson noted. A whole generation of executives never learned how to use a typewriter, and they have no intention of interacting with a CRT on their desk that is tied to an electronic mail system, he said.

A recent survey showed that almost 350 of the Fortune 500 firms will implement electronic mail by 1982, but these companies have a lot of work to do in a short time, Anderson said.

Communicating Word Processors

In a related session, Philip Hayes, manager of telecommunications ser-

Word Processing Slated as Topic Of Seminars

SANTA MONICA, Calif. — A series of seminars on "Word/Text Processing — Toward the Automated Office," sponsored by the American Institute of Industrial Engineers (AIIE), will be held between June and November.

Making appearances in Los Angeles June 11-13, Atlanta Oct 10-12 and New York Nov. 28-30, the seminars will be aimed at those concerned with current operations and planning for future word/text processing innovations in correspondence and document systems.

The theme of the conference is the identification and solution of word/text processing problems in business, industry, education and government. Sessions will survey the technology, organization and management of word processing systems, as well as various applications including correspondence and document preparation.

Also considered will be personnel matters, procedures and software issues, input/output considerations and management of word processing systems. Executive support systems will be discussed as well.

The registration fee for the conference is \$295 for AIIE members and \$330 for nonmembers. When three or more people from the same organization attend, the first two registrants pay \$235 each.

Registration may be made through Department PR, AIIE Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

vices at 3M Co., related his experience implementing communicating word processors. After surveying departments within the company, it was found that only 10% of typical documents had to be delivered within an hour. About 30% of the documents had a same-day priority and 60% could wait until the next day.

Before installing the communicating word processing equipment, it was found that mail was handled in nine different ways by a staff of 41 persons. Out of 36 million pieces of mail handled annually, 65% was intracompany and 64% was typically sent within a radius of 20 miles.

Since 1978, when 40 systems were

installed, 3M Co. has saved an estimated \$1 million, mostly in workers' time. The effect has been most dramatic on the clerical/secretarial worker who has to type the memos and other documents involved.

But there are also savings for the writer of the document. An analysis of the benefits showed the savings actually split about 50-50 between memo writers and those who prepare them, Hayes said.

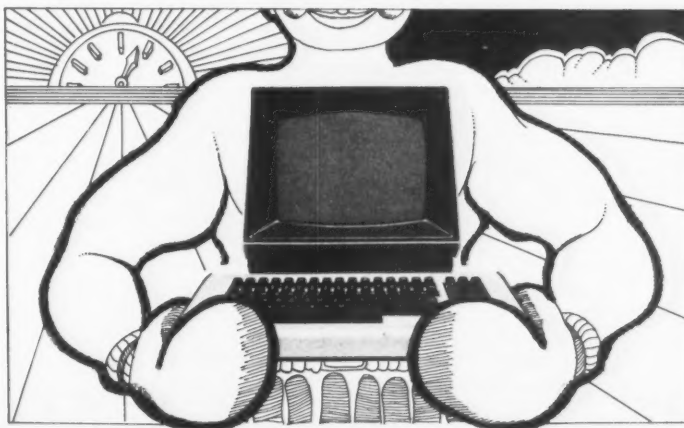
Communications were added to the word processors with a store-and-forward switch from Univac. It took three man-months to develop the terminal handler in the store-and-forward switch. The software incorporated in

the terminal handler is used in conjunction with a synchronous message protocol that operates at 1,200 bit/sec and was also developed for the system.

A document index maintained in the switch determines which documents are to be transmitted to other sites and which are to be forwarded to stations at the same location. Most people need two days of training to get familiar with the system, Hayes said.

Among the benefits of the communicating word processors are a reduced central site staff, better accountability and elimination of the need for rekeying when the same message is sent to multiple locations, Hayes said.

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Quality, Innovation Earmark F International

By a CW Staff Writer
When F International Ltd. began operating in 1962, the company was considered revolutionary. Now, 17 years later, the firm maintains a reputation for innovation as well as quality.

F International consists of more than 500 panel members servicing an average of 1,000 clients, according to Group Financial Director Anne Russell, who is currently in the U.S. instructing the company's new affiliate, Heights

Information Technology Service, Inc., on methodology and managerial techniques (see story on Page 11). Some members are handicapped and some are men, but the majority are working mothers, she noted.

It was nearly seven years before the company gained real acceptance from the public. "We had to prove to clients that a group of people working remotely could put out a 'quality' project," she said. This concept won't be as diffi-

cult to establish today, although persuading people to try something always takes time, she added.

Money's Worth

But British employers now realize that the company gives them their money's worth. Projects are produced on schedule and with more flexibility than in other firms. Nearly 80% of the clients contract with the firm regularly. Some employers even encourage staff members who are resigning to have children to join F International so they will have access to their skills later on, Russell said.

F International's clients include British Steel, Shell Oil Co. and numerous other large and small firms. The company has found that large contracts with teams of 20 to 30 members are the most profitable, but small business contracts are the fastest growing section of the business. F International conducts feasibility studies and hardware and

software evaluations and does systems analysis and design, programming, maintenance and project control.

Most women don't leave the company to return to full-time employment since they usually reach a level of responsibility they might not have attained elsewhere, Russell noted. A system of tenure awards has been established to encourage members to stay, and most of the staff members have more than 10 years of DP experience, she said.

British women face less discrimination in the DP industry than in other fields, although few women have reached the management level, according to Russell. Since F International is composed primarily of women, the company considers itself to be both a woman's company and a company of women.

"We're not really trying to prove anything on behalf of women," Russell said. "F International is simply a group of individuals trying to do an acceptable job and does not differ much from other companies."

Former DPer who are now mothers form a large and for the most part untapped pool of talent.

Since the need for software support is critical now, women should be given the opportunity to work, she noted.

The company is highly visible because it is composed mostly of women, she said. Employers are apt to notice the one woman in the midst of all the men seeking the client's contract. But after the initial recognition, it is up to the panel members to do a good job, she said.

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Workshop Topics

The workshops will cover the DP planning process as an effective management tool, organization and staffing, the evaluation of current DP facilities, trend analysis, internal audits, systems development and the establishment of a time-based development schedule, a spokesman said.

The seminars will also focus on user applications vs. DP capabilities, the measurement and evaluation of equipment capacity and technological industry projections.

Discussions, interactive exercises and documentation will be used heavily throughout each of the workshop sessions, the spokesman added.

The session fee, including luncheons, is \$695 per person. Additional information concerning the workshops is available from the firm at 11317 Old Club Road, Rockville, Md. 20852.



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Alternative for Mothers, Industry Service Bureau's Women DPer's Work at Home

By Ann Dooley
CW Staff

Women DPer's who would like to continue their careers without giving up the experience of child rearing may do both through Heights Information Technology Service, Inc.

With newly opened offices in Oakland, Calif., and White Plains, N.Y., Heights offers programmers and analysts projects on a contract basis.

Heights' large "panel" of DPer's work at home for the number of hours each one chooses and will offer customers a "quality" job at a reasonable price, according to Luanne James, advisor and co-founder of the fledgling alternative services firm.

Although the company is ideally suited for the working mother, Heights is open to hiring any qualified individual with a legitimate reason for seeking other than a standard 9 a.m. to 5 p.m. workday and who wants to work at home, James said. This includes single fathers and handicapped individuals. But she emphasized that the firm is not seeking moonlighters.

Start-Up Stage

The company is still in the start-up stage and although it is currently working on several contracts, its focus is on lining up qualified programmers and systems analysts with diversified knowledge and skills.

Heights intends to stress its members' professionalism and competence to clients, so it is requiring three years of work experience from prospective programmers and at least five years of experience from its systems analysts. By the end of the year, Heights expects to include 40 to 50 members in each branch office with 10 to 12 team members working continuously in each branch on a minimum of 10 contracts. Although Heights is starting with only two branches, the firm intends to become nationwide by 1981.

The industry has a real need for this kind of work alternative, according to James. Although women may face less discrimination in DP than in many other occupations, they still must fight against the idea that their career is over once they have left the work force to have a baby. "It's difficult not to work full-time and continue in career pathing," she noted.

But the Heights approach allows these women to maintain their skills and keep in contact with other DP professionals and employers. This makes it easier to rejoin the full-time work force later.

Role Model

Heights patterned itself after (and is affiliated with) F International Ltd., a part-time, at-home software service company that has been operating successfully in England for the last 17 years. F International, which has subsidiaries in Holland and Denmark, was interested in spreading the idea to the U.S. (see Page 10).

Together with James, president of Argonaut Information Systems, Inc., a software products firm, and Burton Grad, a computer consultant, the details for a license to use the British company's techniques and methodologies were hammered out.

Probably the biggest problem the

company will face is to convince clients that people working away from the client's business site will be able to get the work done. "It will be difficult for them to accept since they won't see it happening in front of them," James said.

This problem can be overcome by providing a high quality of work for each client and building up references, she noted. Employers may be wary of women working at home without direct supervision, but these women are usually very committed.

The productivity factor of workers hired for a set number of hours should be higher than that of a worker in a full-time job where more time is

wasted, James theorized. "We believe that employers eventually will come to view the company as a really good resource and find the part-time flexibility that Heights offers an additional advantage," she said.

Hungry Industry

Although James contends that Heights will offer better prices and better quality than its competition, she also believes that the industry is in desperate need of competent software firms. The number of computers is proliferating so rapidly that the industry professionals can't keep up, she noted.


The smaller firms that are entering

into automation can't afford their own DP departments but still need professional help. And that is where Heights comes in, James said.

The company doesn't intend to limit itself to small companies, however, since large users might need smaller projects done quickly by an outside firm. The flexibility that Heights offers can be a definite advantage in these instances, she said.

Heights intends to pursue those contracts that it has the skills to fulfill, such as Cobol programming and commercial applications analysis. It will stay away from scientific applications — at least at the beginning, James said.

(Continued on Page 12)



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DP in the '80s: More Costly, Less Reliable?

By Brad Schultz

CW Staff

MIDDLEVILLE, N.J. — DP may be more expensive and less reliable in the 1980s because of expected shortages of oil, electricity and raw materials, according to an independent management consultant here.

Dwindling oil reserves are crucial to the production of plastic, Belden Menkus pointed out. And plastic is a principal component of computer systems, serving as the substrate of mag-

netic tape and disk storage units, as cabling insulation and as the basis of peripheral device containers and many other systems products.

Moreover, oil is needed to manufacture ink, which printers apply to paper for hard-copy computer output. And paper is produced through consumption of natural gas, Menkus noted. Shortages of natural gas have occasionally idled paper mills.

Oil and gas are major sources of electric power generation in the U.S., and

shortages of electricity may be another serious problem for computer installations [CW, May 7].

In an electricity crunch, power fluctuations that randomly reverse the values of memory bits and cause read/write errors are more likely to occur. Brownouts imposed by utility firms significantly reduce uptime for most computer systems; and rotating blackouts — a drastic means of rationing electricity — create power surges that can destroy circuitry.

Menkus believes a number of computer rooms located in Sunbelt states may be solar-powered in the 1980s. For as long as the sun shines on such facilities, they will not need conventional energy sources likely to rise in cost and wane in supply.

But sun-driven heating systems normally require a large amount of water to be carried through a building's walls as the medium of heat transfer, he continued. The walls of a solar-heated computer room thus would be vulnerable to leaks that could destroy a CPU.

Enemy of the North

As for the nation's Snowbelt, Menkus believes urban DP users can expect more frequent local power line and telephone line outages in the coming decade. The reason? Salt, regularly sprinkled on city streets to hasten snow melting, has for years washed below ground to corrode subterranean cabling.

In many cities, the cables through which digital data is transmitted and processor power is drawn are 30 to 40 years old and falling apart, Menkus claimed.

In fact, the routing of essential cabling through older neighborhoods is,

in some cases, a complete mystery to utility firms, he said. Faced with emergency outages, utility maintenance crews have spent anxious minutes prowling streets with metal detectors in a search for the wires at fault.

Trouble in Africa

What else could go wrong? In Africa, political turmoil in the 1980s may retard the flow of strategic materials to the U.S., including metals needed in manufacturing computer systems. The nation imports 98% of its cobalt, most of it from Zaire, according to Bohdan O. Szuprowicz, president of 21st Century Research [CW, March 12].

Szuprowicz has predicted more disruptions of the copper mines in Zaire's Shaba province. Since cobalt is a derivative of copper and a constituent of the motors used in computer systems, Shaba's problems may be passed on to users in delayed systems deliveries and increased purchase prices.

One Solution

The trend toward miniaturization in the computer industry partly offsets this problem, Menkus said, explaining that as systems get smaller they entail less consumption of raw materials. But miniaturization also makes it difficult for vendors to minimize circuit failures.

As mean-times-before-failure fall, vendors may find disposable circuit boards an appropriate solution, Menkus noted.

Relatively inexpensive, disposable boards would obviate the need for circuit repairs, which are likely to be more expensive in the 1980s as maintenance personnel salaries continue to rise.

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Service Bureau's DPs Work From Their Homes

(Continued from Page 11)

"We plan to provide training for the panel members so that if someone has a special knowledge or skill, other members can be trained in it. A key to our planning is to utilize our resources to the fullest," she noted.

As contracts come up, one of the two Heights branch managers will provide a proposal for the client on a time and materials basis, assigning the panel members with the necessary skills and time to fulfill the contract. The manager can show the client the cost, available skills, number of people and duration of the project.

Project Managers

Once a contract is awarded, a project manager is selected who ensures that each team member meets deadlines and standards of quality. Project managers will change with the project so that each panel member can sharpen managerial and software skills.

Team members will work at their homes and meet at planned times to coordinate activities for the client site, someone's home or the firm's business office.

The panel members are part of a registry and are not considered employees of Heights. They are not obliged to work on any project and can select the amount of time they wish to work each

week — which is expected to average 25 hours.

If they undertake a project, they sign a contract to fulfill a certain amount of work in a certain amount of time. If any member fails to live up to a contract, that member will be replaced.

But it is the project manager's job to ensure that this doesn't happen and the branch manager's job to screen out any applicants who may not be able to work in an unsupervised situation, James said.

Team Coordination

The biggest problem with the team concept will be coordination and communication between team members. But the lack of communication simply requires a little more documentation, which is one reason the company can guarantee a good product, James claimed.

Pay for the panel members will vary with the time spent on each project, James said. It will probably amount to approximately \$12 an hour for programmers with three years of experience and up to \$18 or \$20 an hour for high-level members, she explained.

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Manipulates Simulated Electronics Mart Raytheon Wins National Management Joust

By Jay Woodruff

CW Staff
CAMBRIDGE, Mass. — For a series of gambles including liquidations and the timely sale of one of his divisions, John A. Pustaver Jr. took the \$2,000 first place award in the first annual National Management Tournament.

Pustaver, a senior software engineer at the Raytheon Corp. in Wayland, Mass., beat more than 130 teams and individuals in a contest to post the highest earnings per share of the firms the contestants pi-

lotted through a computer simulation of the electronics industry from 1970 to 1975.

The tournament was launched last October by Simtek Co., a Cambridge-based firm of simulation specialists. It attracted entrants from eight computer firms, 19 graduate business schools and 22 corporations. Each participant was assigned a firm with six product lines, and each firm competed against 13 other firms in a group.

Other winners included V.A. Cornell of the Coastal States

Petrochemical Co. in Corpus Christi, Texas, who won \$1,000; Jeffry L. Stoddard of the Continental Bank in Chicago, who won \$500; and Henry M. Dachowitz of the Harvard Business School, who won the \$400 fourth-place prize.

Pustaver was "delighted" to learn he had won. He said he had an idea his imaginary company was doing well and that he had a chance, although he admitted that he had had a "false start" in the beginning, when he misread the instructions.

Each participant was required to make 11 decisions affecting the company's growth, including decisions on investments, shares issued, shares repurchased, divisions liquidated, tenders acquired and promotion budgets for each of the six product lines. Each of the decisions made by the 14 competitors in each

group was supposed to take no more than an hour a week to complete.

All the decisions were processed simultaneously by Simtek. The results were returned in the mail before the next management decisions were due. Decisions were made every two weeks for three months.

The move that helped take Pustaver to the top of the personal calculator industry and to the highest earnings per share of the competition may have been putting his financial services division up for bid and getting an offer for six times its earnings. "I can't believe anybody offered so much for it; it was sold for more than it was worth," he observed.

Ultimately, the move helped Pustaver shed what Simtek called a "high debt exposure" and contributed to his assumption of a 30% market

share of the calculator industry.

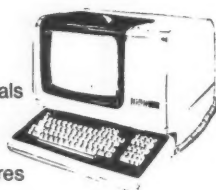
"But what was important was trying to see trends," he said. "In the course of the contest, I was able to come up with a formula I thought they might be using. It wasn't 100% successful, but it was enough to make a decision."

Pustaver did not rely on any of the computers at Raytheon, preferring to work out formulas on a Hewlett-Packard Co. HP 19C calculator. The corporation that Pustaver maneuvered to capture the top prize was itself modeled by Simtek after a Fortune 500 electronics firm, according to tournament director Francisco James.

While the simulation covered the years from 1970 to 1975, Simtek tried to discourage competitors from going back into history to determine strategy. "All the figures they needed to make decisions were provided," James said.

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Ford, Notre Dame Developing Model of Catalytic Converter

By Marcy Rosenberg

CW Staff
NOTRE DAME, Ind. — Ford Motor Co. has teamed up with the University of Notre Dame to develop a computer model of the way automotive catalytic converters work. The project is aimed at designing a converter that will better conserve fuel and still meet environmental standards.

The first phase of this three-year project is supported by a \$98,000 grant from the Department of Energy (DOE). Research results will be made available to the public, according to Dr. Arvind Varma, Notre Dame associate professor of chemical engineering.

Catalytic converters are added to a car's exhaust system to convert pollutants such as hydrocarbons and carbon monoxide to harmless vapors such as water, carbon dioxide and nitrogen. However, automobiles so equipped get fewer miles per gallon than those without catalytic converters, Varma said.

Varma emphasized that the goal of the research project is not to redesign the converter structure. "Before changes can be made, we must find out what is happening now" in terms of the nature and speed of converter reactions, he explained.

To this end, the university's researchers will work closely with personnel from Ford's catalytic reaction engineering group to develop a mathematical model to test the factors

that affect catalytic converter operations.

Modeling will be done on Notre Dame's IBM 370/168. Several of its Fortran integration subroutines will be used to solve boundary-value problems.

"Canned" integration algorithms from IBM and other sources will help researchers integrate differential equations.

Plans are to use the model to

determine the optimal catalyst size, position and composition and to pinpoint the catalyst characteristics that need improvement. Roughly \$10 to \$15 worth of catalyst is in every car; each converter means an additional expenditure of \$200 to \$250, Varma noted.

The first phase of the project expires this month. Varma said DOE verbally agreed to provide \$151,000 to fund the second phase.



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Bettors Left at Gate As System Goes Down

By Jeffrey Beeler

CW West Coast Bureau

LOS ANGELES — An unknown number of racetrack bettors here found themselves unable to collect their winnings recently when a computer breakdown erased all record of their wagers a few minutes before post time.

The incident prompted one of the disgruntled bettors, Lisa Caiden, to file a class action suit demanding that the Hollywood Park Race Track explain its refusal to pay off her winning \$10 bet.

Under ordinary circumstances, Hollywood Park keeps track of all its bettors and the amounts they wager with a 128K-word Univac V76, which receives its input from a series of American Totalisator, Inc. TIM-300 CRT terminals. Shortly before the fourth race on May 12, however, an electronic malfunction apparently interrupted the power flow to the V76's 6M-word mass storage unit, where all the track's better information is filed, and wiped its memory clean.

Unable to tell who had bet how much on which horse, track officials announced they had ceased taking wagers for the fourth race. A few minutes later, the race went on as scheduled. Summer Time Guy — Caiden's pick — finished first.

Track officials then announced they would not honor winning tickets but that they would refund bettors their original wagers. True to their word, the

officials reportedly refused to pay Caiden her fourth race earnings, which she claims totaled \$91, although they did offer to return the \$10 she spent for her ticket.

Three days later, Caiden filed her lawsuit in an attempt, she said, to keep Hollywood Park from declaring the fourth race a forfeit until she could present her case in court.

No Answers Yet

American Totalisator, which supplies much of Hollywood Park's computerized betting equipment, is currently analyzing the track's transaction tapes in an effort to pinpoint the cause of the system's breakdown. So far, investigators have proven unable to find any definitive answers.

American Totalisator President Jim Pierce, however, described the malfunction as "possibly heat-related." On the day of the malfunction, the Greater Los Angeles area was suffering one of its famed Santa Anas — the hot, dry wind that periodically sweeps seaward from the surrounding Southern California desert.

When the breakdown occurred, the temperature in Hollywood Park's computer facility had reached 97°F, Pierce said.

Whatever its cause, the problem kept the track's system down for about an hour — long enough to prevent officials from accepting bets for the fifth race.

New Harvard Curriculum Includes DP Requirement

By Jay Woodruff

CW Staff

CAMBRIDGE, Mass. — Harvard University has announced the first major reorganization of its undergraduate education program in 34 years, including a requirement that all students have at least an "elementary acquaintance with the use of time-shared computers."

Freshmen will be required to demonstrate their ability to handle the math and computer-related skills needed to undertake the mandatory core of science courses, according to Associate Dean Charles Whitlock of the faculty for special projects. Of the 1,600 freshmen, it was estimated that 1,200 would already have DP skills.

The requirement for some sort of math expertise and a basic understanding of time-sharing and other fundamental aspects of computer operations was established after last year's incoming freshmen were tested for "quantitative reasoning" skills. The results, according to Whitlock, were "shocking."

"Some of our freshmen could hardly add two plus two and get four," he said.

Since the science department was responsible for giving these freshmen a grounding in the sciences, it asked the school to require the students to show that they are not "totally unfamiliar with time-sharing, statistical reasoning, handling graphs, extrapolation and other functions," Whitlock ex-

plained.

Students can take noncredit refresher courses and examinations any time before beginning the science courses, he added.

Sample of Courses

Among the 55 courses that will be offered next fall to the 1979 incoming freshmen are "Dynamics and Energy — Concepts and Applications," "The Astronomical Perspective," "Space, Time and Motion," "Elementary Particle Physics" and "Discovering the Bases of Life." Whitlock dubbed these "broad 20th century science courses."

Computers will be used in some of the core science courses, and the school is asking that the students know enough about them so they can go to the science facility's question center for help in solving problems or completing tasks.

Of the total of 84 courses that will form the science offerings for undergraduates, more than 50 are new and most of the rest have been substantially changed.

By 1982, when the program is fully implemented, as many as 100 courses may be offered.

Next year's freshmen will be required to take at least two half-credit courses in their first year, four in the second and eight in their third year.

"In a modest way, this is just a general updating of the general education program, bringing it up to date for the '70s and '80s," Whitlock said.

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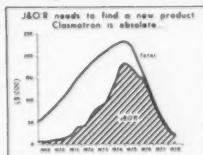
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EDITORIAL

An Achilles' Heel

"Garbage in, garbage out" — that old programming adage — should be carved in marble above the entrances to several major federal agencies. It might help federal technocrats understand why their prestige nearly melted down on Three Mile Island and why it is tumbling to earth with the Skylab space station.

The mystique of computing, which has carried that prestige through rough spots before, is wearing very thin. Nuclear reactor plants should be showcases of computing prowess, given their complexity and the extent to which computer systems determine their design and policies. Yet flaws in software and misuse of computer hardware seem to have played a crucial role in history's worst reactor accident.

The National Aeronautics and Space Administration (Nasa), which thrilled us in the '50s and early '60s with many of the first computer-guided space flights, has earned our contempt with its colossal bungling of Skylab — now due to strike the earth's surface this summer in an area "limited" to where 90% of the world's population resides.

Computer systems were used to generate projections of Skylab's course before it was launched in 1973 and have plotted violations of those projections ever since. On premature reentry, attributed to the effects of sun spots, Skylab is now expected to break into more than 500 pieces weighing a total of 25 tons that will hurtle down at up to 300 feet a second. Nasa has lately tried to avert panic by proclaiming there is only one chance in 150 that a person will be injured or killed by the molten debris [CW, May 21].

But Nasa won't even have a rough idea of what part (or parts) of the planet will receive the debris until an hour or two before impact, according to agency spokesmen. If there is an injury, any local hospital should be able to handle it, one source observed. So should the local mortuary.

So long as systems run true to their programming, computer errors are human errors. In the long, complex programs used to design a nuclear plant or guide a spacecraft, bugs inevitably crop up as a result of human oversight.

But supposedly sophisticated technical specialists who fail to allow for such lapses of judgment or skill — who fail to concede the limits of computing as a tool — are public nuisances. They certainly should not be subsidized by the public.

Certain processes of nature may elude our understanding more than we are willing to admit. Nuclear fission and celestial mechanics may be among those processes. While computer systems are necessary in the attempt to extend our understanding, the limitations of computing cannot be ignored — in fact, they are technocracy's Achilles' heel.



LETTERS

Mere Mortals

Michael Wood's discussion "Systems Analyst' Title Most Abused in Industry; Redefinition Imperative" [CW, April 30] represents a breakthrough in the evaluation of the system analyst's function. The analyst, as Wood might have us believe, is actually no more than a thin disguise for God!

In this capacity, he will be fully cognizant of the wishes of both the organization he serves and those of the customer. When the customer, as benefits one of his ignorance, strays from true enlightenment, the analyst will "assist the user through constructive suggestions and guidance."

The analyst will become an "orchestrator of programming efforts" as the project proceeds and in the end will produce a document (holy writ?) which will "serve as the foundation of the organization's planning activities in the future."

It may interest Wood to know many organizations contain persons — called managers — whose job it is not merely to coordinate, orchestrate and document, but to actually produce something useful and get it out the door on time.

In most cases, managers do not have a clear understanding of their own organization's objectives, much less those of the end user. Often they don't have the freedom to concentrate on the new system without worrying about the old one. In the majority of cases, they can't build a hardware/software independent design because the software skills of their staff and the hardware they use have practical limitations.

In every case with which I am acquainted, they resent their management calling in people from the "systems" group of an accounting firm and giving the consultants information that was previously withheld from the internal DP organization.

DP managers, programming man-

agers and operations managers are human beings and thus fall short of Wood's paradigm. Many of them, to their everlasting credit, refuse to have anything to do with persons who represent themselves as the type of individual Wood described.

John Boddie

Newark, Del.

Congratulations to Yourdon

Let me congratulate *Computerworld* and Ed Yourdon for the April 9 article on the failure of the structured revolution.

The conclusions in this article can be applied in many other areas as well. Possibly some psychological answers can be found as the very group that bases its life on change refuses to accept new concepts or change in their own area.

There have been many viable concepts that have gone down the tubes when pressure has been exerted.

It can also be said that DP organizations and their memberships are not "sales" oriented. The smarter they become, the more introverted their actions.

Change can be forced on them by the user community, but they lose their cool when their own activities are evaluated.

Also, please look back a few years to decision table processing, which was actually a start to structure. This admirable concept has also bitten the dust and, regardless of efforts to establish its value, it remains one of the extinct species.

The problem that most seem to forget is the programmer himself might become extinct as efforts to develop artificial intelligence become realities.

Both of these techniques were designed to permit complex logic to be understood by man and machine rather than accepted on faith.

A. Vasek

Grand Rapids, Mich.

DATA PAST

Five Years Ago May 29, 1974

SAN FRANCISCO — Intel Corp. modified IBM's DOS/VS to make most of the operating system's capabilities available to 360 and 370 systems running in nonvirtual or "real" mode. The revised software provided more flexibility than conventional DOS and, according to several benchmarks, faster throughput than unaltered DOS/VS.

CORVALLIS, Ore. — Bill Fellingner, a member of the Association for Computing Machinery, was praised for his takeover of a state IBM 370/158 from a remote terminal in an attempt to

prove the system's lack of security. Fellingner managed to show that the potential existed "for unauthorized data and personnel file manipulation of disastrous proportions."

Eight Years Ago June 2, 1971

WASHINGTON, D.C. — The U.S. Supreme Court refused to hear a test case on the right of a citizen to see secret government records about him or to challenge their accuracy. The court voted seven to two against hearing the case but gave no reason. Catherine Tarver of Seattle raised the issue with the aid of the American Civil Liberties Union.

HUMAN CONNECTION/Jack Stone

Performance Measures Need User/DP Accord

"Obfuscate: to muddle; confuse; bewilder" — Webster's *New World Dictionary*.

Don't keel over when you read this, but the U.S. Department of Energy does something right. No, sorry to say, I'm not referring to its resolution of the energy crunch, but to its funding of a landmark research effort by one David F. Stevens of the University of California, who discovered that some of the most widely accepted measurements of computer performance are, in fact, "obfuscatory" and tend to justify the complaints of users that the DP manager seems to be ignorant of the real performance problems.

Stevens' thesis is that traditional ways of measuring computer performance measure "the wrong things, the right things wrongly or nothing at all." He claims that, as a result, the DP manager views the DP operations "through the rose-colored glass of obfuscatory measurement, which pre-

vents the system in a much more favorable light than that perceived by the user."

The importance of his findings should be clear. If the fundamental measures of DP department performance are not completely understood and accepted by both the user and the DPers, the results are inevitable: unending disagreements, strong dissatisfaction, even hostility.

He wrote: "DP management cannot understand the users' legitimate distress and interprets their complaints as mindless nit-picking; the users, on the other hand, see their complaints answered by performance figures that do not reflect their experience and that lead to no improvement. In order to bridge this communications gap, DP management must adopt a set of measures that illuminate, rather than obfuscate, the true external character of the system."

Stevens believes that the use of con-

fusing systems measurements allows the DP manager to "claim — and substantiate — superlative performance, even in the face of extreme user discontent." He went on to say that "there are two basic elements of success in computer center management: the

is "process time vs. system wait time, possibly by category."

Here are Stevens' rules for the creation of obfuscatory measures:

- On selecting the measures: "Tailor your measures to the tractability of your users and the gullibility of your

'If the fundamental measures of DP department performance are not completely understood and accepted by both the user and the DPers, the results are inevitable: unending disagreements, strong dissatisfaction, even hostility.'

achievement of saturation and the demonstration of efficiency," and use of obfuscatory measurements "contribute(s) to (this definition) of success by rewarding pessimal [sic] performance, thus increasing saturation."

Let me summarize what Stevens wrote about some of the measures in common use. He said that what is termed "availability" is actually "up-time," and what should be measured instead is "availability for general-purpose use, as a percentage of a real time." And the "mean time between interruptions" parameter is really the "mean time to crash," whereas he recommended a measurement of the "mean service interval."

Finally, Stevens claimed that what is being measured in the case of "interactive response time" is actually meaningless and what should be measured

upper management ... and always have a couple in reserve, just in case ...

- When in doubt: "Seek the advice of your mainframe vendor. Remember, your vendor cannot sell you additional equipment until your upper management is convinced of the saturation and effective utilization of your existing configuration ..."

- On obtaining the measures: "The easier a measure is to obtain, the more likely it is to be obfuscatory. Two specific kinds of easy measure are worthy of individual mention: means and percentages. Suitable definition of the base can turn any measurement into a praiseworthy percentage ..."

- On defining a measure: "This is an indispensable element of the obfuscator's arsenal ... for the most misleading percentage you can devise won't

(Continued on Page 22)

THE TAYLOR REPORT/Alan Taylor

DP School Grads Headed For Employment Letdown

Worcester Junior College, in Worcester, Mass., goes under a number of names. One of them is "Computer Learning Institute." You won't find that in the telephone books.

You can find out quite a lot about the flag-draped campus on Main St. by looking at the terminals in the classroom and talking to college officials. But there is much more than meets the eye.

Some problems come in when you try to find the basis for the claims the school makes in newspaper and other advertisements. It claims that practically anyone between the ages of 19 and 50 who can pass the programmer aptitude test with at least 40 out of 135 possible correct answers will be employable as a computer professional after taking the day or evening programming course. It further claims that pay for such employment starts in "the mid-teens" — some \$14,000 or more year.

The fact that the school has yet to graduate a class (it only started this course last November) and that teaching five computer languages really does not make a professional programming school is not deterring the school from making these claims. In fact, it is now recruiting for the next class, starting in August or September, at a price of more than \$2,700, which is the current rate. Teenagers in the inner city and foreigners in distant states receive the same general pitch — and presumably the foreigners are expected to be made happy by their colorful native flags flying there.

In June, however, problems for the DP community of the Worcester area will start, when the first graduates start looking for jobs with ridiculously high expectations as to their employability and, certainly, as to what salary their terminal training will command. And this is a general problem for the community — not just for the school and its advertising agents, if it has any.

Not that I am ignoring the problem of the school, but there are plenty of ways to deal with deceptive advertising. The problem is I know very few ways of dealing with the deceived graduates. And I live quite near. The last time I had occasion to consider this situation, I ended up employing the student concerned in another capacity until he later went to school and learned a different specialty.

That is not a general solution, however. This time, I am asking the DP community what should be done. After all, it should feel somewhat responsible for letting this advertising go on in its midst while it remains silent.

The move to terminal training, of course, has reduced the entry level positions open to hopeful inexperienced programmers. When schools had small systems of their own, the students also got hands-

(Continued on Page 24)

READER COMMENTARY/Joe Rigo

Technical Writers Should Study Computer Science

It used to be that no one grew up wanting to be a technical writer. People switched into writing and system documentation from somewhere else — journalism, teaching, music and even programming.

However it happened, the number of full-time professional systems writers increased rapidly. We have now reached a point where we are attracting people who actually wanted to be writers from the start.

One sign of this is that our colleges are offering more and more courses in technical writing. A person can major in technical writing and get a bachelor's degree, a master's or even a doctorate, which boggles my mind.

For many college English departments, the trend is salvation. The increased interest in technical writing offsets a decline in the traditional literature courses. So the professors are moving to meet the demand. Shakespeare's loss is DP's gain.

Still, the field is far from mature. Computer systems writers remain fragmented, disorganized and without professional leadership.

A typical writer is often a lonely soul who was hired to develop documentation standards for a Cobol shop. Once finished, the writer is assigned to document all current and future systems according to the new standard.

It is a big job for one or two people,

and the success rate is not overwhelming. But it pays well, and there is strong demand for people who are willing to try it.

The computer hardware manufacturers employ legions of writers. They must turn out an endless stream of manuals to support new mainframes, peripherals and system software.

There is also a large body of free-lancers. In this area, more than any other, fees increase with a person's ability to write fluently on increasingly technical subjects.

As organized professionals, however, DP writers have not evolved as far as medical writers. The medical specialists have been around longer. There are enough of them to support their own professional association, trade journal and ongoing education programs.

DP writers are still mixed in with technical writers in general. We can join the Society for Technical Communications, but we must share it with specialists in everything from aerospace to zoology.

We have journal articles and conferences, but they focus on the lowest common denominator. They give us a steady stream of inspirational essays about spelling, grammar and how to write good. There is little help for that lonely writer who must figure out how

(Continued on Page 22)

COMMENTARY/Connie Winkler

Seeds of IBM Trial Sown in Watergate Days

John Dean's story of Watergate, *Blind Ambition*, which was dramatized in a TV mini-series last week, underlined why the U.S. vs. IBM case went to trial. It's a story that wasn't discussed at the time of the ITT scandal, but which is coming out now in bits and pieces as the parties again look at the question of relief.

In the TV movie, John Dean got called back to Washington from a tryst in Paris with news of Jack Anderson's newspaper column on the Dita Beard memo chronicling the \$400,000 Nixon campaign contribution in return for the Justice Department's dropping of its antitrust suit against ITT.

Dean was told by John Haldemann that this was the worst scandal ever — Watergate was still only an apartment complex.

It was in this frantic scenario that IBM's general counsel (and former U.S. Attorney General) Nicholas deB. Katzenbach and now IBM chief trial counsel Thomas D. Barr, together with Bruce Bromley of the Cravath firm, began negotiating to settle the IBM antitrust suit out of court. It had been filed on the last day of the Johnson Administration in January 1969.

According to more than one source close to the case, it was because of the circumstances surrounding the ITT

debacle that the Justice Department could not announce another settlement. The Justice Department had managed to settle the two previous antitrust actions it brought against IBM.

Dean's portrayal of the ITT affair and the public's anger at the time support this theory behind the Justice Department's push to try the case. It was the politics of the day that caused it to actually go to trial.

A footnote to the *Blind Ambition* story was set down during the deposition of IBM chairman Frank T. Cary this past week. In early 1973, Cary sent a telegram to President Nixon

criticizing lawyers with the Justice Department.

Dean was apparently not so involved in Watergate that he didn't have time to acknowledge Cary's telegram — and Dean's letter and the telegram to Nixon were introduced during the deposition. Cary said his comments to Nixon concerned remarks made by Justice Department lawyers after IBM settled the private lawsuit with Control Data Corp.

As part of that settlement, CDC destroyed its computerized index to IBM's documents — which the Antitrust Division lawyers apparently intended to use in U.S. vs. IBM.

If politics caused the IBM case to go to trial, politics are still influencing it.

Earlier in the deposition, Cary told of a letter he wrote last year to President Carter and of a private visit with Sen. Edward M. Kennedy. In each case, Cary said he wanted to present IBM's side of issues Carter and Kennedy had addressed.

Today, John H. Shenefield, Assistant Attorney General in charge of antitrust, regularly urges that large, complex litigation — of which the IBM case is the granddaddy — be moved along quickly. But in the courtroom, the trial merely plods along, causing IBM counsel to challenge Shenefield's statements.

To decipher what's going on today will take another television show based on memoirs from the Carter Administration — or its successor.

Judge David N. Edelstein should get a merit badge for sitting alone through four long years of the IBM trial. But even Edelstein has apparently wearied of the ordeal because it has been halted since April 11.

Edelstein, through his law clerks, has reported he is working on the numerous motions he's been bombarded with lately — at least 14 in one month.

In the stack on Edelstein's desk are two monstrous motions that will greatly affect the remainder of the case — one regards relief and the other is known as the "Cary documents" motion. In both instances, the Justice Department wants lists of additional documents from IBM: first, on relief so that it can plan how to break up IBM if need be; and second, relating to IBM chairman Frank T. Cary so that the government can cross-examine him, probably later this year.


IBM strongly and vociferously denied the government demands and filed its own motions to quash the document requests.

In the six weeks he has considered the motions, Edelstein has responded to a handful, but none of the big ones.

The real problem, however, is not that motions are not forthcoming but that the trial is stopped. Such stop-and-start operation feeds an unhealthy precedent. So far, there have been only 30 court days since Jan. 1.

Other equally complicated cases have moved more rapidly. It may be time in the IBM case to experiment with time management techniques from those trials.

Winkler is a CW staff writer.



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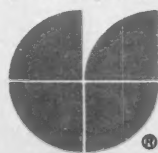
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the hexadecimal kid and his faithful dog ascii

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BIT 4
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The Hexadecimal Kid and Simula have been rescued from the clutches of the evil Dr. Null by their robot assistants, Fetch and Execute. Leaving Dr. Null safely bound up to 2,400 feet of magnetic tape, Hex and Execute have repaired the damaged Ascii. Simula has just rushed

in with some news from the Database.

Simula spread the printout before them.

"Very interesting," Hex said. "He's the son of Abraham Synapse."

"Who?" Execute asked blankly.

"Don't you robots ever run the Archive program when you're on the Network? Or do you spend all your time playing Star Trek?" Hex demanded sarcastically.

Simula explained: "Professor Abraham Synapse invented the so-called Synaptic Junction, the neural interface unit which made possible the development of androids."

"He was, in fact," Hex went on, "one of the founders of Neurocybernetics and also a pioneer of robot design. His work at the Institute of Cybernetic Studies forms the theoretical basis for modern robotics."

"Not only that, when he came to the U.S., he helped perfect the CAFE technique without which the Data Base would be inconceivable, and then went on to develop the MICE and more powerful RATS (Remote Access Time Sharing) systems — forerunners of the Network. We literally owe our existence to him."

"Well, his son is certainly not a chip off the old block," Execute concluded with matchless robotic wit.

"No," Hex replied in the same vein, "he seems to have a chip on

(Continued on Page 24)

Writers Needs DP Background

(Continued from Page 17)

to document a Cobol system for the maintenance programmers.

Rensselaer's Example

The college technical writing courses are equally generalized. They rush students through a maze of survey courses in chemistry, math, biology and increasingly, computer programming. The students absorb a little jargon and a few basic concepts, but they are not prepared to deal with practicing professionals.

In this respect, Rensselaer Polytechnic Institute is leading a move for greater emphasis in DP education. A couple of years ago, it started requiring all of its technical writing graduate students to take at least one computer course.

This year, Rensselaer advanced one more cautious notch. Prof. David Carson, the course director, says the young writers are strongly encouraged to attend as many as possible of the informal minicourses at the school's computer center.

The Next Step

The next step, at Rensselaer and elsewhere, should be for the faculty members to attend these courses. Students are not going to write seriously about technical subjects until they have professors who can grade their papers intelligently.

Right now, our college technical writing courses stress basic English composition with a lot of technical jargon thrown in. The students are all being trained to write the science column for *Time Magazine*. DP needs more people who can write about system topics in ways that will be meaningful to programmers as well as end users.

Also, I suspect, our field might actually benefit from a larger dose of academic research. It would be helpful to have a few professors studying the systems writing profession as it actually exists.

Our professors have gone halfway. They have dropped out of English, but they have not moved into computer science. They are still parsing sentences when they should be drawing flowcharts.

I hope more of them will make a commitment to computer systems writing. Rigo is president of Sysdoc, Inc. in New York.

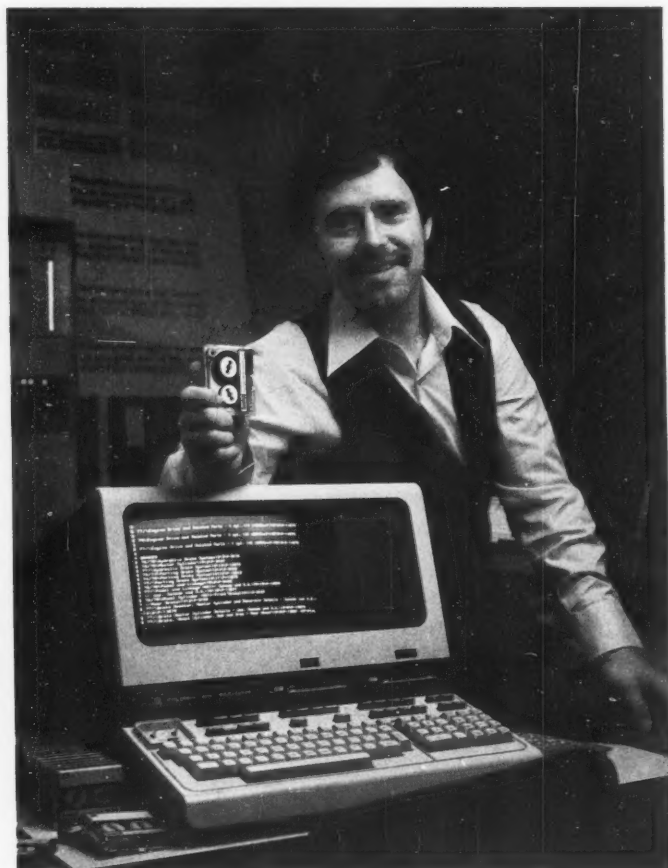
Measures Lack User/DP Accord

(Continued from Page 17)

help unless you can convince someone that it measures something. If yours is an elementary situation, actual definition is not important: a catchy name is all that is required ... Remember 'CPU efficiency'? Was there anything efficient about it?"

Stevens is with the Laboratory of the University of California at Berkeley. His work was performed under the U.S. Energy Research and Development Administration's W-7405-ENG-48 and published later for the 1978 National Computer Conference in a paper titled "How to Improve Your Performance Through Obfuscatory Measurement."

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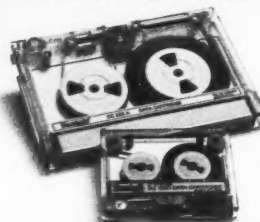
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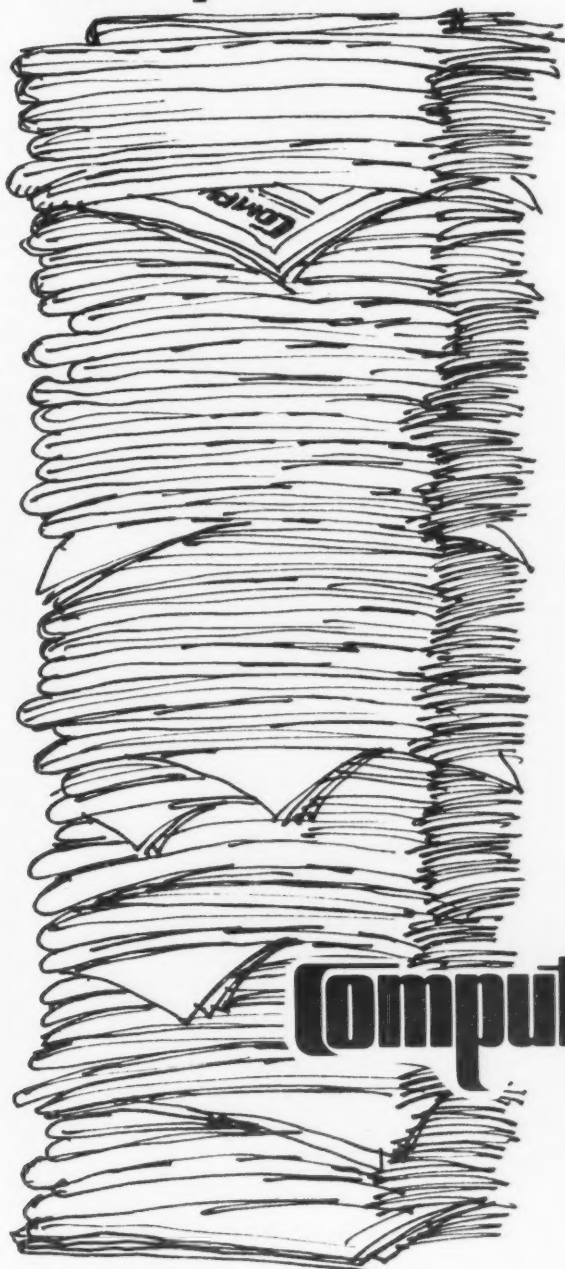
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Helping Deceived Grads

Have you ever met with programming graduates who had unreasonable job or salary expectations as a result of deceptive advertising? Yes _____ No _____

If so, what did you or your DP societies do about it? _____

What do you suggest that Worcester area people do? _____

Are you able to help in any way, if asked? _____

Please return form to Alan Taylor, c/o Computerworld, 797 Washington St., Newton, Mass. 02160.

Name _____ Position _____

Address _____

Professional Society Memberships _____

Students in for Letdown

(Continued from Page 17)

on training in operations and even in data entry. This helped them into the DP field and later brought them into some programming positions.

I just can't see this type of entry occurring for Worcester graduates, and I certainly can't see graduates walking into those "mid-teen" salaries as a general rule. And unless they do, there will be a set of DP people out there who have been trained to believe that the computer field — in which we make our living protecting information — approves the false use of claims with neat loop-holes built in.

But how can we help? I am not very far away — in Framingham, Mass. I'd be happy to meet with some of the students privately and let them know anything I know about the real world.

And I have no doubt that many programmers in the area (which is rich with computer firms like Digital Equipment Corp., Data General Corp. and Prime Computer, Inc.) would also help.

I'd like to know both what you would do if you lived 20 miles from a DP school like this one and what you will do if any deceived graduates ask your help.

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Hex, Friends In More Trouble

(Continued from Page 22)

his shoulder instead," Simula groaned; and Hex continued: "He may even have killed his father. The circumstances surrounding Prof. Synapse's death were exceedingly suspicious, and his son disappeared at the same time. When he emerged again, he was a different man — with a vengeance."

"He is clearly far more dangerous than we thought," Simula said.

"Yes," Hex agreed, "and he must have learned a lot about the Data Base management system from his father. It's a good thing Fetch has gone to alert the ERROR Squad."

At that point, Fetch returned. "I'm afraid there was a 'transmission fail,'" he apologized. "I couldn't get through to the Error Squad."

"That's odd," Simula said, "I had no trouble."

"You had better try again right away," Hex ordered, "and if the line is still down, use the radio link."

Before Fetch could move, a voice they now knew too well interrupted them. "Good evening."

They froze. Standing in the doorway was Dr. Null, free once more and this time with Ascii at his side. Hex reacted fast. "Get him boy!" he called to Ascii.

Ascii did not move. "He only responds to my commands now," their adversary said. "Perhaps next time you will be more careful when you give him an overhaul. The ROM chip you fitted him with was one of my own design. I have converted him to Ebcdic."

As Dr. Null was speaking, Execute was frantically signalling Hex on their private UHF wavelength. Hex switched over to listen. "Permission to attack?" Execute asked. "That dog is no match for a full-sized robot."

Hex was dubious. For one thing, he was not anxious to see Ascii reduced to a pile of scrap silicon. For another, he had equipped Ascii with certain defensive mechanisms that Execute knew nothing about. He only hoped that Dr. Null was equally unaware of the fact that Ascii's eyes could emit high-energy laser beams. "Better wait for the moment," he told Execute over the intercom. "There must be a better way."

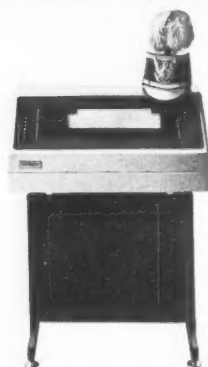
"There is a better way," Dr. Null agreed. "Stop this nonsense and do as I tell you."

Hex was dumbfounded. How could a mere human listen in on a UHF transmission?

Beware of the next issue!
Forsyth is software manager for RAIR Timesharing in the UK.

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For IBM Mainframes Technique Aids CPU Acceptance Testing

By Louis C. Murphy

Special to CW

Production Acceptance Testing (PAT) is a recognized DP mechanism for determining the viability of hardware and software. While acceptance testing dates from the very beginnings of DP, it has remained a somewhat intuitive process and has undergone little refinement.

The Institute for Software Engineering has recently developed a technique that can eliminate some of the uncertainty surrounding acceptance decisions for IBM and IBM-compatible CPUs. This technique uses standard instruction mixes and hardware monitoring experiments for determining the performance characteristics of the processors and, in conjunction with other services provided by the institute, comprises a complete CPU performance evaluation methodology.

Acceptance testing for new CPUs or enhancements to CPUs, such as MOD-3 upgrades and the System Extension (SE), is of particular concern to DP installations because of the large incremental costs associated with CPUs and the recognition that the majority of work performed in a computing configuration is performed by the CPU.

Similarly, installations with multiple CPUs of the same model are concerned that these machines have equivalent amounts of processing capability.

Acceptance decisions based on inaccurate or incomplete data can result in additional unplanned costs associated with having large quantities of unused capacity or in costs associated with serious performance degradation through overuse.

The institute's CPU Power Calibration In-

strument (CPCI-1) supports the acceptance testing mechanism by providing facilities for processing a workload with known characteristics, measuring the results and comparing these results with other experimentally derived data.

Description of alternative approaches to acceptance testing are welcome and should be addressed to Don Leavitt at CW, 797 Washington St., Newton, Mass. 02160.

Production acceptance testing has historically addressed the two fundamental issues of functionality and performance. But the function characteristics of a particular CPU — for example, buffer size, parallel processing of I-unit and E-unit and levels of decode — can have significant measurable effects on the CPU's performance. It is these performance characteristics with which CPCI-1 concerns itself.

CPU performance measurements, however, are not the only factors that can affect system performance. For example, the CPCI-1 instrument (CPCI-1) supports the acceptance testing mechanism by providing facilities for processing a workload with known characteristics, measuring the results and comparing these results with other experimentally derived data.

(Continued on Page 26)

Languages, Operating System Available for DG Micronovas

WESTBORO, Mass. — An operating system called Micron and a pair of high-level languages — MP Pascal and MP Fortran IV — were introduced at mid-month by Data General Corp. for use on Micronovas and Micronova-based systems such as the recently announced MP/100 and MP/200s.

Micron has a modular internal design that lets the user select the routines needed for his operation without carrying the overhead of the full system. The system is compatible with DG's Advanced Operating Systems (AOS), used on the Eclipse minicomputers.

In addition, programs developed on the smallest Micronova can be run on the largest Eclipse, a spokesman said.

Programs can be burned into programmable read-only memory (Prom) for faster execution, but this option would probably be exercised only after the program was fully debugged and ready for production use, he added.

Micron was designed to improve programmer productivity through utilities such as an interactive debugger and the availability of the Pascal language with its development and runtime features.

A single-user multitasking system intended for the real-time environment, Micron supports a file management structure that provides multiple levels of directories. Random-access files can address any record or disk with a single SEEK command, the spokesman claimed.

Most of Micron's utilities are operationally compatible with AOS. The Command Line Interpreter (CLI) is a proper subset of the

AOS CLI that provides support for interactive program development. CLI includes a macro facility for combining related routines under one command, he continued.

The Micron text editor lets users create, modify and merge text files. Once the user has written assembler, Pascal or Fortran

(Continued on Page 26)

DBMS for DEC Users Gains More Than 50 Enhancements

CAMBRIDGE, Mass. — Version 114 of the System 1022 data base management system (DBMS) includes an interface with the SPSS statistical package from SPSS, Inc., a file backup and audit trail, a global change facility and support for "unbundling" data subsets for specialized use.

More than 50 enhancements combine to make System 1022 "the friendliest data base capability available for Digital Equipment Corp. mainframes," a spokesman for Software House, Inc., claimed.

The SPSS interface is the first such linkage between a DBMS and SPSS available to Decsystem-10 and 20 users, he said. It is particularly useful to the user who wants to produce statistics or tables from data in the data base, he added.

Increased security is said to be the key benefit of the audit feature, which maintains journal files for the data base and helps restore files to good condition following a sys-

tem crash.

The job of making changes to the data base is "greatly simplified" by the TRANSACT command that has been added to Version 114, the spokesman said. Record reformatting is not required for all changes; if no description is used, the input file is assumed to have the same structure as the master records.

By "unbundling" the data base files — storing data records apart from keys and other system information — Software House has made the data directly accessible to a "wide range of ad hoc tasks" without conventional programming, the spokesman asserted.

The cost of System 1022 depends on the CPU to be utilized. It will range from \$31,000 to \$42,000 until June 15 and from \$2,000 to \$53,000 after that, he reported from 1105 Massachusetts Ave., Cambridge, Mass. 02138.

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Technique Aids Measurement of Performance

(Continued from Page 25)

ever, must have some real-world sense to them. Cycle times, millions of instructions per second (Mips) rates and the like are all to some extent meaningful performance measures, but are of little value in themselves in determining the performance or processing power of a particular CPU. Again, production acceptance standards for performance must be expressed in some dimension that an installation can equate to the desired performance of its workload.

Describing the expected performance of a workload and the processing power of the CPU in equivalent terms is one of the critical aspects of production acceptance testing. Workloads are typically expressed in jobs or transac-

tions; performance is generally expressed in jobs per hour or transactions per second. This brings us a little closer to solving the problem of determining performance measures.

But as the complexity of the workload increases, it becomes increasingly difficult to describe the expected performance of the processor. Should it be in jobs per hour or transactions per second? Should it be some combination of the two?

Responding to the Problems

CPCI-1, using software physics theory, directly responds to the problems of the development of production acceptance standards and the measurement of workload performance against these standards. The quantity of work

to be processed, or the "magnitude" of the workload, is expressed in software physics terms as "work," or byte transfers between processors and storage media. The performance or power of the CPU of interest is expressed as the rate of doing work, or works per second, for example.

By processing a workload of known magnitude on a particular machine and measuring the execution time required to process this workload, it becomes fairly easy to determine power.

Remembering, however, that acceptance decisions will be made based on these experimental results, a number of other questions remain to be answered. Does CPCI-1 constitute a valid benchmark? To what degree do these results reflect the behavior of a

live workload?

The answers to these questions are based primarily on the representative nature of the known workload. CPCI-1, being the known workload of interest, provides not simply one "typical" workload, but a range of workloads.

These workloads are actually sets of instructions called "kernels" that attempt to represent commercial workloads, which perform decimal arithmetic, sort workloads, which perform field moves and compares and scientific workloads, which perform floating-point arithmetic.

These kernels, executed independently of each other, actually determine a range of powers, or power band, for the CPUs of interest. This is a much more reasonable approach than attempting to express CPU power as a single quantity, since power is very much workload-dependent.

Production acceptance testing can be substantially improved using some of the other components of the Institute's CPU Power Service in conjunction with CPCI-1. For example, the standard hardware monitor experiments allow any installation to capture its own instruction mix. An additional kernel can be constructed using this set of instructions and installed into CPCI-1.

This approach improves the representative nature of the workload and can become a standard installation benchmark. Because CPCI-1 is self-instrumented and has its own reporting capabilities, the benchmark is truly portable and requires no additional measurement or reporting facilities.

The CPCI-1 software and other components of the power service can significantly improve the production acceptance process in the DP industry. The service is available to both members and nonmembers of the institute, which can be reached at P.O. Box 637, Palo Alto, Calif. 94302.

Murphy is with the Institute for Software Engineering.

DG Micronovas Get Languages

(Continued from Page 25)

source programs and compiled or assembled them into object files, the binder utility combines them to form program and overlay files.

Pascal has been described as a structured language. In addition to supporting a block structure, it has a data definition facility for creating new data types, a record structure composed of different data types, a CASE statement, string data type and string operations and enhanced I/O, the spokesman noted.

Fortran IV is a variation of ANS Fortran 66 and as such is largely compatible with ANS Fortran 77. It provides a range of data types, predefined mathematical functions and both formatted and random-access I/O.

The Micron operating system package, including a macro assembler and multiple utilities, costs \$1,500. The Pascal compiler and runtime library support costs an additional \$1,000, while the Fortran compiler, including an optimizing capability, costs \$500.



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DP Dialogue

Advertisement

Notes and observations from the IBM Data Processing Division that may prove of interest to DP professionals

Coffee to Go: Customer Order System Starts up Fast

"We created our online customer order processing system with just four programmer-analysts. It took only 15 months from the inception of the project to startup of the system nationally."

Frank Pinkela is manager of the Information Systems Department of Hills Bros. Coffee, Incorporated, San Francisco, one of the oldest and largest purveyors of coffee in the United States. He is describing his company's new transaction-oriented system, which supports a nationwide network of terminals.

"It permitted us to cut the time between receipt of an order and mailing the invoice by 14 days, taking \$3 million out of our receivables float," Pinkela notes.

"We tightened inventory from a four or five week supply down to 3½ to 4 weeks; at the same time we raised the customer service level from 96 to 99 percent," says Allen Weitzel, corporate distribution manager.

"We previously had a card-oriented batch system," Pinkela continues. "So we had to write online programs from scratch, including support for our terminal network. We could not have done it in so brief a time without DL/I and CICS."

Data Language/I (DL/I) is an IBM data base manager that organizes and stores the data for any number of application programs. The Customer Informa-

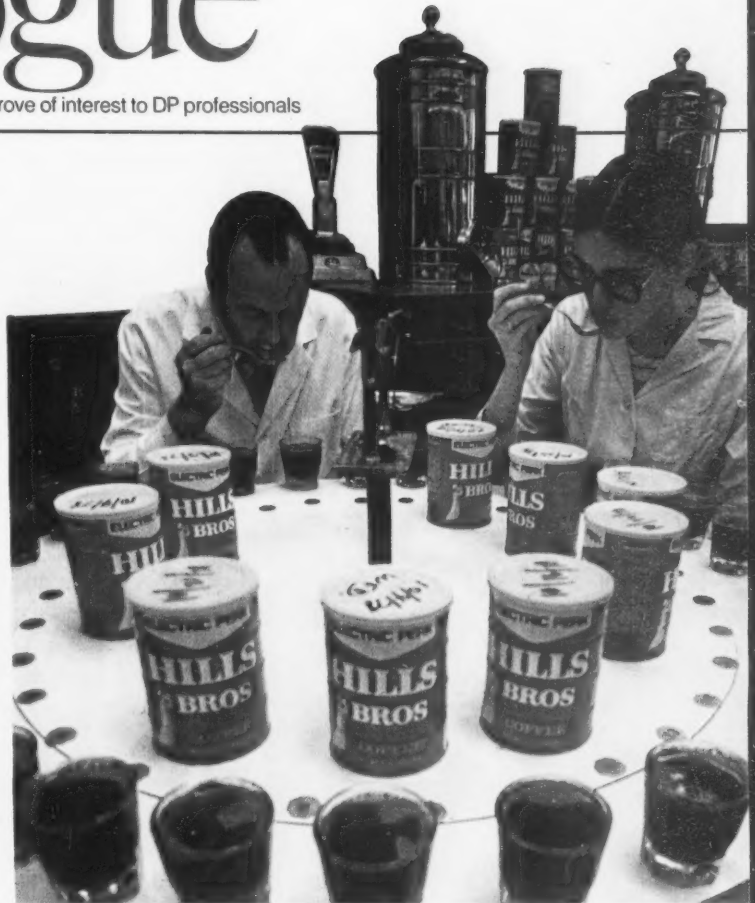
tion Control System/Virtual Storage (CICS/VS), also an IBM program product, complements DL/I by handling the details of transaction processing and terminal support.

Programmers at Hills Bros. worked at IBM 3277 Visual Display Stations to develop the system, using Source Program Maintenance Online (SPMOL). This IBM program product provides for writing and editing of a program directly at a terminal, and submitting it to the batch stream for compilation and execution.

"SPMOL increased our programmer productivity by 50 percent," Pinkela says. "They get faster turnaround on compilations, immediate diagnostics, and management of source code for test and production."

"Now that the system is up and running, we are adding to the data base for future applications such as a forecasting model and an online inquiry capability. In two years we've covered a lot of ground; today the information systems function at Hills Bros. is prepared to grow as the business grows."

At Hills Bros., experts sample coffee, then proportion the blend. In 15 months, the company implemented an online order-processing system supporting a nationwide network of terminals.



AAA Of Michigan Accelerates User Service

"Our users in research and evaluation groups now get promptly the small-scale analysis programs they vitally need – by writing them in APL themselves," says Charles L. Cone of the Automobile Club of Michigan. "This puts them at the head of the line, no matter how heavy the development schedule is for our major in-

teractive systems."

The Automobile Club of Michigan, headquartered in Dearborn, is the largest insurance carrier among the clubs of the American Automobile Association. Cone, assistant director, administrative and financial operations, notes that actuaries and other analysts quickly mastered APL

– a user-oriented IBM programming language.

"From our interactive business system we extracted a research file: a cross section of all policies in force. With an APL program, a user can organize or restructure this data in any way that proves useful for analysis. And we have developed a 'corporate data base' – a set of 150 separate files of financial information: losses, premiums, and so forth for the last 15 years."

The business system, online to branch offices throughout the state for claims and

premium processing, runs under Information Management System/Virtual Storage (IMS/VS) on a System/370 Model 168. (APL runs on a Model 158 Attached Processor in the same center.) Research files developed from the IMS/VS data base are studied by the APL users with the aid of Data Interface, an IBM program product.

Actuaries, Cone points out, manipulate various coverages in the research file, and financial analysts enter rate changes into cash-flow calculations, to see the impact immediately. With an APL cost model, accountants ask "what if" questions, testing the effectiveness of alternate policies.

"Previously," Cone continues, "we developed this kind of analysis by giving a clerk a desk calculator and a printout of a complete file. Now we write an APL program to run against a data base, do the data reduction, and produce the desired analysis directly. The time required for one such task – a report on loss reserves – was cut from three days to one hour."

"In this way we short-circuit a two- to three-month program development cycle. Soon, our professional programmers will be doing only the difficult jobs – the big online programs – and everything else will be done by the users themselves. Today, in fact, our project people organize and test their programs in APL, defining system specifications and transcribing into COBOL only after everything is shaken down and validated."



The Automobile Club of Michigan insures homes, cars and boats for its members. Financial analysts at the club's Dearborn headquarters use APL, a user-oriented IBM programming language, for a wide range of studies and evaluations.

DP Dialogue is designed to provide you with useful information about data processing applications, concepts and techniques. For more information about IBM products or services, contact your local IBM branch office, or write Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

IBM
DATA PROCESSING DIVISION

Order, Cost-Estimate Package Operating on IBM 5110s

WARRINGTON, Pa. — Integrating order entry and tracking, price/cost estimating and cost variance accounting, A Cost Estimating/Order Control System (ACE/OCS) is written in Basic and running on IBM 5110s.

It will soon be available in Cobol and other languages, however, for other mini, micro and full-sized systems, according to vendor Bernard Giffler Associates.

The package has eight primary modules. Two develop material requirements and costs, machine run times and costs and total costs (direct plus burden) for current order

and requests for quotations (RFQs).

Other modules extrapolate and, if necessary, recalculate prices, material requirements and machine run times for varying order quantities. Others accept production performance reports during the course of orders' manufacture and calculate current and cumulative cost/performance variances based on the data used to develop the orders' cost estimates.

ACE/OCS can be leased for \$150/mo or purchased. Customizing is available on a fixed-fee basis, the vendor said from 34 Linda Lane, Warrington, Pa. 18976.

Four Subsystems Beef Up Capabilities of 'Boss/3'

PLEASANT HILL, Calif. — Four optional subsystems are now available for the Boss/3 on-line executive software from Century Analysis, Inc., providing users of NCR Corp. mainframes with interactive program development, file maintenance and management facilities that aren't in the basic package.

The base implementation is primarily limited to support of interactive processing and data entry operations, a spokeswoman noted.

Perhaps the most unconventional of the four subsystems, the Message Switching/Broadcasting option provides communications between terminals linked to an NCR Century 101.

Because of its store-and-forward capabilities, this software can be used to support an electronic messaging operation with items addressed to individuals or groups of people having access to the terminals.

The On-Line Program Development subsystem provides full text editing and job scheduling capabilities.

In Interactive Screen Building subsystem enables the programmer to maintain an on-line screen file in an interactive mode. With the subsystem, the user can create, revise, display or delete a screen layout, the spokesman noted. A list of screens in the library can be produced in batch mode, she added.

The Interactive File Maintenance subsystem supports both file inquiry and file maintenance and is managed through operator security information and screen parameters. Even if a file is not in the Boss/3 system, it can be accessed once the operator describes it to the executive program.

Boss/3 requires 45K of main memory for its resident portion plus 2K for each data entry terminal and 2K minimum for each interactive processing terminal. The software runs under B1, B2, B3, B4 or VRX environments.

The basic package costs \$11,000. The Message Switching and Interactive Screen Building subsystems cost an additional \$1,000 each; the On-Line Program Development facilities cost \$800 while the Interactive File Maintenance costs \$1,500.

Century Analysis, Inc. is at 3343 Vincent Road, Pleasant Hill, Calif. 94523.

'Select' Runs Under RSTS/E

LEXINGTON, Mass. — Select, a fast record extraction package that runs under Digital Equipment Corp.'s RSTS/E environment, is now available from Evans, Griffiths & Hart, Inc. (EGH).

The package extracts records on the basis of user-specified criteria and writes them to an output file with or without intervening operations. Transformations of input data by key field deletion or by rearrangement are one form of possible intervention; sorting the selected records into a new sequence might be another, a spokesman said.

Speed is the key advantage of Select, he asserted. As an example, he described a situation in which Select was run stand-alone on a PDP-11/40 with cache memory. From an input file of 40,000 32-byte records, Select extracted and (using EGH's Fsort3) sorted 10,651 16-byte records in one minute, he claimed.

The major component of Select is a 2K-word machine language runtime system which is installed under RSTS/E, version 6C or later. Installation time is minimal, the company said.

The package costs \$1,500 for a single CPU license, including warranty and update service for a year. Substantial discounts are available to current users of Fsort3, the spokesman noted from 55 Waltham St., Lexington, Mass. 02173.

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Service Helps Sites Recover From Disaster

By a CW Staff Writer

GAITHERSBURG, MD. — In response to recent communications emergencies arising from the Three Mile Island disaster and tornadoes which struck various parts of the country, American Satellite Corp. (ASC) has announced a standby communications service for users with critical applications.

Designed to get users back in operation within 48 hours after major destruction of existing facilities, the Quick Reaction Communications (QRC) service makes use of transportable earth stations.

Implementation of QRC includes the development of a recovery plan to work out the details of restoring service. The user would pay a readiness fee and a deployment charge based on the cost of moving the required earth station to the user site; QRC would provide a user with 12 voice channels or a 56K bit/sec data link depending on the application.

Details of the service are still being worked out, and QRC is subject to regulatory approval. It would also be made available to emergency disaster relief agencies. The service is expected to begin in January.

The service will be available for a maximum of 30 days, after which normal contract rates would be negotiated.

Tentative rates would be a \$2,500 one-time charge for the recovery plan, a \$1,250/mo readiness charge covering one to five locations and an equipment deployment charge consisting of the actual cost plus 15%. Twelve voice lines would cost \$12,000/mo, and one data link would cost \$5,000/mo, the company said.

ASC is based in Gaithersburg, Md.

To Enhance Phone, Terminal Message System, Datacryptor Introduced

By Ronald A. Frank

CW Staff

HOLLYWOOD, Fla. — A terminal-based electronic message system and a data network encryption device led the product introductions at the recent annual conference of the International Communications Association (ICA) here.

Rolm Corp. of Santa Clara, Calif., moved into the office of the future by adding an

electronic message system to its CBX switchboard.

Called the Rolm Electronic Message System (Rems), the capability adds a teleprinter or CRT to the ETS 100 digital telephone which is a part of the CBX system. Rems is said to use an existing redundant processor within the CBX to add the electronic mail functions without affecting existing voice communications.

Rems was designed for the 5- to 10-line memos that are "so profuse in every office," according to a Rolm spokesman. These messages are stored in the CBX processor and can be accessed by any Rems user who enters an authorized password in order to read the contents of his mailbox. Messages are displayed on the CRT and can be printed out at those stations with a teleprinter capability.

On existing CBX systems that have the redundant processor, Rems is field-upgradable. Part of the electronic mail capability is Release six software for the CBX, the firm said.

A typical Rems system will cost about \$600 per user for a 10-terminal configuration. Field trials of Rems will begin late this year with first deliveries in early 1980. The CBX system is available from Rolm distributors.

Datacryptor Debuts

Racal-Milgo Corp. of Miami, Fla., introduced the Datacryptor, which adds an encryption algorithm to terminals connected in point-to-point, multipoint or multidrop network links. The Datacryptor is installed between the terminal and the modem and can operate on all-digital links. The unit generates a random version of the 56-bit National Bureau of Standards encryption algorithm without the user knowing the actual key.

The selected key is loaded into a storage module and can be used to initialize an identical key at remote site datacryptor units. The system loads dual keys into all units in

(Continued on Page 30)

Acoustic Coupler, Modem Give Up to 1,200 Bit/Sec Operation

IRVING, Texas — Vardon and Associates, Inc. has added the TC 3003 acoustic coupler and TC 4004 auto-answer modem to its data and telecommunications equipment line.

The acoustic coupler provides full-duplex, true asynchronous serial data operations up to 1,200 bit/sec when coupled with its companion auto-answer modem or up to 300 bit/sec when used with the Bell 113B modem, the company said.

Both units were designed to optimize the transfer of medium-speed data over voice-grade telephone lines and the long-distance direct dial network. Features include originate and answer modes that are switch-selectable and acoustic and Data Access Arrangement (DAA) private-line interfaces, also switch-selectable.

The coupler and modem are compatible with all computer systems and data terminals using Bell 103 handshakes, Vardon said.

The TC 3003 has an acoustic interface via

the Western Electric 500 handset or its equivalent, direct via DAA or its equivalent with a pot-adjustable transmit level and receive sensitivity of ac -15 to -21 dBm and -45dBm plus or minus 3db, respectively. Speeds of 300 and 1,200 bit/sec are switch-selectable, and the coupler is DAA-, RS-232C- and 20mA current-loop-compatible.

Full-Duplex System

The TC 4004 uses the RS-232C interface and is an automatic-answer, full-duplex system with a receiver sensitivity of -49dBm. The transmit level is -6 to -12 and is pot-adjustable.

The modem comes with power indicators for power, automatic answer, data terminal ready and remote test and on/off switches.

The TC 3003 and TC 4004 cost \$695 each, or lease for \$29/mo over 12 mo, from Vardon and Associates at 930 Beltline Road, Irving, Texas 75061.

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COMMUNICATIONS

Modem Runs At Eight Miles

WHEELING, Ill. — Gandalf Data, Inc. has introduced a synchronous short-haul modem designed to operate at speeds up to 9,600 bit/sec and distances up to eight miles on four-wire dedicated circuits with characteristics similar to unconditioned and nonloaded data channels.

The LDS 329 operates at 2,400-, 4,800-, or 9,600 bit/sec and conforms to EIA RS-232C and CCITT V.24 standards, Gandalf noted.

The LDS 329 operates on constant carrier, has an internal crystal clock and phase-lock loop. It is priced at \$450, Gandalf said from 1019 S. Noel, Wheeling, Ill. 60090.

DTS Has Register, POS Terminal, Scanner

MAYNARD, Mass. — Grocery store and supermarket retailers have more choices to make on food store systems and equipment with Data Terminal Systems' (DTS) recently announced cash register, point-of-sale (POS) management terminal and modular scanning and checkout system.

The Model 219B electronic cash register can be used as a stand-alone terminal or can be expanded into a complete POS system, DTS said. From its base price of less than \$1,600, the 219B can be ordered with options such as an electronic Load Cell Scale, price recall memory for up to 199 items, register-to-register communication that consolidates reports into storewide summaries and DTS' Ans-R-Tran telecommunication option for remote polling from company headquarters.

In addition, the register is available with a keyboard for up to 39 departments, complete food stamp/trading stamp abilities and a two-direction printer that details each entry with four programmable letters and the facility to automatically endorse checks, the firm said.

The POS management terminal, dubbed the Model 710, was designed to interface with DTS' most advanced POS systems to provide the retailer with ready access to cash inventory and other transaction information throughout the workday. The 710 will be available for purchase "shortly" but the price has not yet been announced.

A modular scanning and checkout system, the Model 5540 includes modules that can be installed remotely for maximum layout flexibility and can be

expanded from a minimum memory of 500 records to include up to 48,000 records and to drive other peripherals, DTS said.

The modular system includes a printer section, a keyboard display unit, a load cell scale, customer and scale displays, a cash drawer and the microcomputer package. Price and availability are yet to be determined.

Data Terminal Systems can be reached at 124 Acton St., Maynard, Mass. 01754.

Message System Enhances Phone

(Continued from Page 29)

the system, but uses only one as an added security feature. The unit is compatible with Synchronous Data Link Control and Binary Synchronous Communications protocols and operates at speeds of 4,800 and 9,600 bit/sec.

The Datacryptor includes a tamper-proof case that erases the key when the unit is opened for any reason. A master station unit costs \$2,200 while a remote site device is \$1,900. First deliveries are scheduled for the fourth quarter of 1979.

Racal-Milgo also introduced an upgrade to its line of network management systems. The Odyssey 100 uses a Digital Equipment Corp. PDP-11/34 with 128K bytes of storage, disk drives, CRT consoles and other peripherals. The Odyssey 100 uses the RSX 11 operating system and includes full software systems support from Racal-Milgo, a spokesman said.

A basic system starts at \$120,000 with multitasking capabilities.

Western Union Data Services Co. of Mahwah, N.J., introduced its Super TWX terminal designed for users with multiple TWX terminals and high-volume traffic. Based on the firm's Smart controller, the Super TWX configuration allows the simultaneous transmission and receipt of messages using diskette storage.

A typical configuration of controller, CRT, receive-only printer, TWX and dial-up ports costs \$381/mo on a three-year lease.

Siemens Corp. of Iselin, N.J., unveiled its EMX 1010 text communication system for Telex TWX and similar services. The system uses a floppy disk program and is said to combine the functions of a switch and remote communications processor. First deliveries are set for October with a price range of \$20,000 to \$80,000 — depending on the configuration.

Teletype Corp. showed a buffered teletype version of the Model 43 teleprinter. The terminal provides 16K characters of solid-state storage and can send or receive data at rates up to 180 char/sec. Designed for dial-up applications, the Model 43 BSR is available on a purchase-only basis from Teletype Corp. of Skokie, Ill.

AT&T showed its recently announced Teleprinter 1000 which uses a DEC teleprinter configured to Bell specifications.

By adding a microprocessor from the larger 2000 series Dimension switch, AT&T upgraded its Dimension 400 PBX. The result is advanced features for the 400 system, which will be available in October.

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trix printer and system software is just \$8,495. Progressive quantity discounts take the unit cost down to only \$6,650 for more than 50 units.

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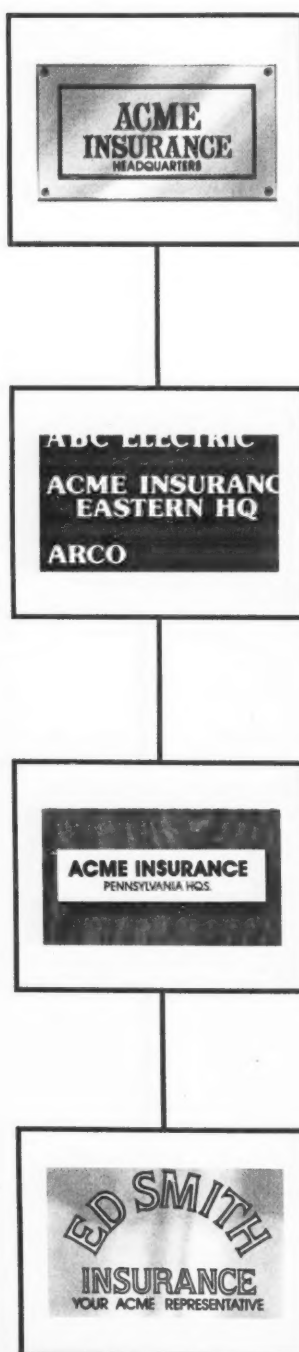
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Quantity discounts

The package price for a 32K processor with communications, one-half million bytes of diskette storage, a 160 cps ma-

For Eyeing Case Progress

Fourth CPU Added to Judicial Network

By Howard A. Karten

CW Staff

WASHINGTON, D.C. — The Federal Judicial Center (FJC), the research and development arm of the federal court system, recently installed a 4M-byte Digital Equipment Corp. Decsystem-10 to join three other Decsystems in providing administrative services for federal district and appellate courts.

The four systems are at the heart of the Courtran II network, which serves courts across the country. Using terminals attached to the system, the courts are able to track the progress of cases and adhere to the standard established by the 1974 Speedy Trial Act, which requires that defendants be tried within 60 days of arraignment or their indictments dropped.

"The courts had to turn to computers to be able to keep up with the recordkeeping they didn't have to perform before the act was passed," according to Charles W. Nihan, director of the FJC Innovations and Systems Division. The legislation provides for certain clear "time-outs" in the 60-day rule, such as when a defendant is being tried in two separate cases. Before the act, the prosecution and the defense could bargain in order to delay trials — in some cases as long as a year, Nihan explained.

The Courtran II system handles approximately one-third of the national federal criminal case load, serving as an information resource to all levels of the judiciary. The system stores information from docket sheets for criminal cases, the identities of attorneys and judges, disposition and sentencing data and other material.

From Typewriters to CRTs

Before the system was installed in 1975, each court's clerk "used to record everything on a typewriter," Nihan explained. "Now, they record everything on a CRT [located either in an administrative area of the court or the judge's chambers] and we can analyze that information for them and let them know how their cases are progressing."

The data collected by the FJC is also analyzed for research purposes, Nihan explained. "We do everything from analyzing different case-processing procedures to see the results to looking at whether jurors' perceptions of trials change if they see them on video tape, as opposed to in person," he said. The reaction to the system by judges and

clerks has been "incredibly favorable," Nihan asserted. "They are aware they're being overwhelmed by the explosion in litigation and are completely willing to adopt any technique that will help them — to our surprise. We thought perhaps they'd be very conservative, but that has turned out not to be so."

Support Disappointing

Despite the acceptance by judicial officials and the importance of the system, Nihan registered disappointment in DEC's level of support. "DEC has been very strong in its commitment to support, but very weak in its follow-up. It seems to me that at least in the Washington area, the base of Decsystem 10s and 20s is expanding at such a rate that it seems the repair people can't keep up with it, and DEC has been unable to honor a contract we have with it for software residents."

"As part of its contract with the federal government," he said, "DEC agreed to provide people who are knowledgeable in DEC systems software to assist installations in making full use of the company's products. The company has been unable to meet the

demand in this area in that it [apparently] cannot either lure people from other DEC assignments or hire people with sufficient qualifications to meet its contractual commitments."

"Most DEC users would like to see improvements in maintenance, I think," Nihan asserted.

Nihan illustrated his comments by citing a DEC product called the Display Object Timesystem (DOT). "The product plain doesn't work, and DEC knows it. It has had three people on-site trying to make it work, and they have to date been unsuccessful. We had [planned on] using DOT, but we can't," he continued.

Despite his comments on DEC's level of service, Nihan was careful to point out that hardware itself was acceptable.

"I feel I can live with the system, but there is substantial room for improvement in the support DEC is giving us in hardware maintenance and in software support. DEC is not as responsive or as competent in the maintenance area as we would like, but the system is totally reliable," he noted.

More Memory and Bigger CRT Enhance Univac Cade System

BLUE BELL, Pa. — Univac has enhanced its Computer-Assisted Data Entry (Cade) shared-processor system with a larger main memory, increased disk storage capacity, a larger CRT, a station printer and the ability to communicate in IBM 3270 protocol.

The enhanced system, designated the 1900/10, is designed for distributed processing as well as data preparation. It can appear to the host processor as an IBM 3270 terminal, allowing it to operate within the same network as 3270 terminals without requiring any changes to the host processor or software, a spokesman stated.

For a purchase price of \$78,884, users get 128K bytes of memory, 8.8M bytes of disk storage, an NRZI magnetic tape subsystem, four 2,000-char. CRTs and four 480-char. CRTs. The monthly rate including maintenance on a five-year lease is \$1,865. Initial deliveries are scheduled for November.

A larger version of this system, with 256K bytes of memory, 50M bytes of disk storage,

eight 2,000-char. CRTs, eight 480-char. CRTs, a phase-encoded tape system and two keystation/printers costs \$138,808. The monthly cost including maintenance is \$3,403.

Memory on the system can be field-upgraded to either 384K or 512K bytes; similar growth paths are available for disk storage, with a first increment increasing capacity to 70.4M bytes and a second to 200M bytes.

The first increment will be available when deliveries begin, while the 200M byte version is scheduled for August 1980 delivery. The printer announced with the system operates at speeds up to 200 char./sec. The CRT has a larger capacity than previously available, displaying up to 2,000 char. on 80-char. lines.

The system is software-compatible with the older 1900 Cade system, the spokesman noted, although users will have to recompile programs before they can run.

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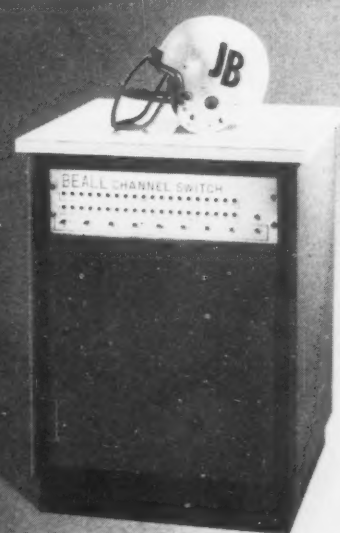
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Design, Auditing, Security Events Coming Up

• Design Automation Meet Set

NEW YORK — The 16th Design Automation Conference, sponsored jointly by the Association for Computing Machinery (ACM) Special Interest Group on Design Automation and the IEEE Computer Society's Design Automation Technical Committee, will be held in San Diego June 25-27.

The three-day meet, at the Town and Country Motel, will be divided into 22 sessions, which will include the following topics: interactive graphics, high-level design techniques, current topics in building architectural design automation, mechanical computer-aided design and drafting, a case study of design automation at Hughes Air-

craft Co., design automation data bases and others.

Registration is \$65 in advance for ACM or IEEE members, \$75 at the door; \$80 for nonmembers registering in advance, or \$95 for those registering at the conference. Fulltime students with appropriate identification can register for \$30.

All registrants will receive a copy of the proceedings.

Additional material and registration information is available from registration chairman Donald J. Humcke at Bell Laboratories, Building WB, Crawfords Corner Road, Holmdel, N.J. 07733.

• Program to Train Auditors

CHICAGO — Shared Resources Institute, Inc. has announced its first public offering of a DP computer auditor training program.

Designed to train auditor-type personnel with little or no DP knowledge in how to effectively and productively perform DP auditing work, the course is composed of 92 hours of classes and workshops, interspersed with 84 hours of self-study assignments.

Four three-day sessions have been scheduled: an advanced introduction to DP for auditors, to be conducted June 4-6; and Ansi Cobol programming workshop, scheduled for June 18-20; an introduction to DP controls

auditing, July 10-12; and a computer-based auditing techniques workshop, set for July 30-Aug. 1.

Program highlights include an introduction to DP concepts and programming techniques, computer-based auditing techniques, various tools for use in auditing and conducting simulated audit interviews.

Tuition for the entire program is \$895. All classes will be held in downtown Chicago. Further information is available from the institute at Suite 500, 625 N. Michigan Ave., Chicago, Ill. 60611.

• Zurich to Host Security Meet

DIX HILLS, N.Y. — Operational Data Security Corp. will hold its 25th International Operational Data Security Workshop at the Zurich Hotel in Zurich, Switzerland, the group announced recently.

The meeting, to be held July 16-19, will address the following issues: computer and credit card fraud, electronic funds transfer, international data flow, privacy protection and monitoring overall computer systems and controls.

Also to be discussed are some state-of-the-art approaches to protecting operating systems from penetration and the use of the National Bureau of Standards encryption standard, biometric approaches to security and electronic motion detection hardware.

Cost of the workshop is \$625. Further inquiries should be directed to conference chairman Robert L. Wilk, president of Operational Data Security Corp., at 6 Swarthmore Lane, Dix Hills, N.Y. 11746.

Integral Data Unveils Printer

NATICK, Mass. — A dot matrix impact printer from Integral Data Systems, Inc. can print characters in any of eight software-selectable sizes and intermix different size characters in a single line of print.

The Model 440 Paper Tiger is a tractor-fed, 7 by 7 dot matrix printer designed for relatively low-volume, desktop use. With a throughput rate of 100 char./sec (at 10 char./in.), the unit prints on either roll or fan-fold paper up to five piles thick, according to the company. The paper can vary from 1.75- to 9.5 in. wide, and the unit can print at 6- or 8 line/in., switch-selectable, the firm added.

Features of the device include a full 96-character Ascii upper and lower case character set, 132 print position and a paper drive with a slew rate of 3.5 in./sec. Transmission rates range from 110 char./sec to 1,200 char./sec and are also switch-selectable.

An optional 2K buffer/graphics package is said to provide full dot-plotting graphics capability, and the unit's print head is rated at 100 million characters, the firm claimed.

The printer cost \$995 from Integral Data Systems at 14 Tech Circle, Natick, Mass. 01760.

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Built Around Intel's 8086

Small Business Users Get 16-Bit Micros

CULVER CITY, Calif. — Rexon Business Machines Corp. has released two models of a 16-bit microcomputer aimed at first-time, small business users.

Rexon's RX10 uses diskette mass storage, while the RX30 employs cartridge disks. Both multiterminal systems (MTS) are built around the Intel Corp. 8086 microprocessor, which features a 200 nsec CPU cycle time, according to Rexon. That processor has an extended instruction set said to provide standard decimal arithmetic operations and byte string processing.

A single plug-in circuit board contains the executive processor and 64K bytes of ran-

dom-access memory, Rexon noted. An additional 64K bytes are field installable and contained on another plug-in board.

Both MTS run Business Basic under the Rexon Comprehensive Application Processor (Recap) operating system. Containing the MTS executive, Basic interpreter, utilities and diagnostic programs, Recap resides in about 24K bytes of storage for both models.

Application program partitions are declared at system generation time, but can be changed at execution time, Rexon stated. The recommended partition size is 10K bytes and 128K-byte systems can support

up to eight operator terminals, handling larger partitions if necessary.

File Capacity

The number of files accommodated on both the diskette and cartridge disk storage media is dependent on the physical capacity limits of those devices, which are 1.2 million bytes and 20M bytes, respectively. Physical sector lengths on both disk media are 256 bytes and sequential and random file access mechanisms are supported, Rexon continued.

Built-in diagnostic routines within Recap exercise the MTS hardware automatically upon system power-up. During this time, the system's processing unit and memory complement are tested and an error message is displayed by all linked CRT terminals in the event an error is detected.

The basic MTS includes a multipurpose device controller with channels for mass storage devices, a printer and up to four CRT terminals, the vendor added.

A second device controller is required to interface more than four workstations or a second printer. On the RX10, the second device controller supports two additional diskette units.

Each diskette unit accepts two-sided, double-density diskettes. The cartridge disk unit provides about 10 million bytes of nonremovable data storage and another 10 million

(Continued on Page 34)

Micro Costs Less Than \$4,000, Stores Half Million Characters

STAMFORD, Conn. — A desktop microprocessor system offering one-half million characters of disk storage and costing less than \$4,000 has been announced by National Computer Communications Corp.

The Series 8000's basic mainframe, the NCC 8032, costs \$3,840 and offers 32K bytes of memory as well as the half-million characters of storage. A companion model, the NCC 8064, provides the same storage capacity and 64K bytes of memory for \$4,300, according to a company spokesman.

Other features are the NCC 803A CRT terminal and the NCC 8050 Read Only printer based on the Diablo Systems, Inc. 1650.

The total system ranges in price from \$6,000 to \$9,000, depending on the number of user-selectable features chosen and the printer selected. The configuration uses floppy disks, and the price includes on-site maintenance service.

The Model 8145 processor, with 14.5 million char. of storage and 64K bytes of internal memory, starts at \$8,990 including disk files. The terminals and printers may be added for a total price of \$12,000 to \$14,000, depending on features.

The Series 8000 reportedly can be used in multiuser/tasking operations for up to four users simultaneously at an additional cost of \$1,200 above the base price. The system can be configured for full ASCII communications use over a switched dial-up network for transmission speeds of up to 9,600 bit/sec,

the spokesman said.

Software packages available include General Ledger, Inventory Control and Payroll. In addition, the system can handle such languages as Extended and Standard, Basic, APL, Pascal, Fortran IV with Floating Point, two levels of assembly language and Cobol with full sort, the spokesman said.

Said to be compatible with most currently available CRTs and printers, the system can be delivered in 30 days from the firm at 145 N. Franklin Tnpx., Ramsey, N.J. 07446.

Boosts Throughput 'Slave' Mini, CPU Share Bus

IRVINE, Calif. — Computer Automation, Inc.'s Naked Mini Division has announced a "slave" minicomputer to function on the same bus as a host CPU, but under its own program control.

Boosting system throughput, slave computing provides modularity of applications software and more efficient memory utilization, a CA spokesman explained. Slave computing was defined as "a technique for improving performance by adding parallel, autonomous computers with their own memory and I/O ports to a host computer system."

Slave processors have "minimal software impact" on the host, the spokesman said. "A slave computer is not limited by bus speed,

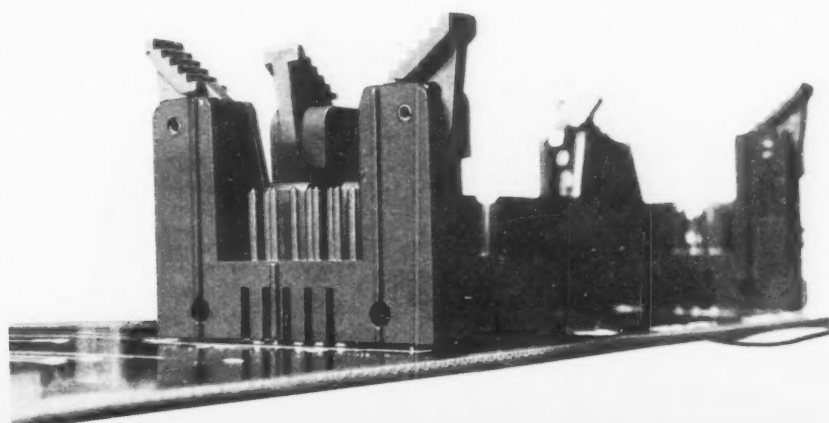
software overhead or memory contention problems when operating autonomously."

CA's 4/105 processor operates as a peripheral direct memory address device for off-loading CPU functions that run concurrent with and independently of the host processor. Intended to serve communications and process control environments in master-slave configurations, the 4/105 plugs directly into the host's chassis and cannot act as a stand-alone system, the spokesman said. Up to four 4/105 processors reportedly can operate under a single host, with virtually all the computing power of each 4/105 available for running applications.

"The 4/105 is distinguished from multi- (Continued on Page 34)

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The NEC Snaplock.



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Southern Office: 2965 Flowers Rd., South, Atlanta, GA 30341 (404) 458-7014

Micro Development System Gains Emulator

SANTA CLARA, Calif. — A device for microprocessor system development is now available as part of National Semiconductor Corp.'s Starplex family of development systems.

The In-System Emulator (ISE) is said to increase performance, allowing real-time emulation of one microprocessor and simultaneous emulation of two microprocessors.

In addition, the ISE offers the reduced costs of a generalized ISE module supporting various target microprocessors and access to the full facilities of the Starplex system, according to Intel. An independent ISE processor, dedicated mapped memory and high-speed buffers located near the target microprocessor are said to aid performance.

The ISE module has its own 32K bytes of memory, logic circuitry, MPU and control firmware. It allows emulation of user devices at full application speed, a spokesman noted.

The ISE emulation processor connects to the device under development via an 8-in. cable "to minimize timing variations," the spokesman said.

The module connects to the Starplex system via an RS-232C interface which does not participate in the actual emulation, but which does communicate setup directives to — and emulation outputs from — the ISE module.

The ISE has two 32-bit breakpoint registers and 128 48-bit-wide cells of trace memory. Each breakpoint register can be masked for "don't care" con-

ditions and set to compare for desired combinations of address and status from the ISE module and the user device, the spokesman said.

Breakpoint conditions can be set individually or triggered only in a chosen sequence, he added. The Starplex system is used for development of both hardware and software for the 8080A/8085 microprocessor and board-level and single-board microcomputers; it is Multibus-compatible.

A standard Starplex system consisting of an MPU, 64K bytes of memory, dual standard 8-in. floppy disk drives providing 512K bytes of on-line storage, a video monitor, a keyboard and a 50 char./sec printer costs \$14,350.

The same configuration with the ISE costs \$17,675; with a 120-char./sec

printer and the ISE, the configuration costs \$19,325 from Intel at 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

Micros Aimed At Small User

(Continued from Page 33)

bytes on a removable pack, Rexon explained. An optional disk unit provides another 20 million bytes — half fixed, half removable.

Operator stations are used for data entry and retrieval and for system control with each station displaying a maximum of 24 lines. Each line consists of 80 characters with each character formed in a 7-by-10 dot matrix; a full set of upper- and lower-case characters is reportedly offered.

A minimum RX10 configuration — 64K-byte CPU, one operator terminal and two flexible disks — has a recommended end-user price of \$16,200. A maximum RX30 system offers 128K-byte memory, 40M-byte disk storage, eight terminals and one 300 line/min. printer and carries a recommended end-user price of \$70,600.

The MTS will be sold through qualified nonexclusive dealers for turnkey placement in customer environments, Rexon said from 5800 Uplander Way, Culver City, Calif. 90230.

Mini, Host Work On Same Bus

(Continued from Page 33)

processing devices by its 'private,' on-board memory and distributed I/O ports," the spokesman continued. The processor directly addresses its own 32K-byte random-access memory and half the host's 64K-byte "public" memory.

Instructions execute out of public or private memory, while data or instructions can be block moved from the former to the latter. "Every time you add another 4/105 to a system, you are adding another 32K bytes," the source observed.

CA's Naked Mini 4 Family and LSI 2 series computer systems have software support for the 4/105. The slave's instruction set consists of the LSI 4/10 standard set plus additional instructions for addressing, communications and master-slave control services.

Software support for configuring LSI 4 series processors with slave processors includes an assembler with 4/105 instructions and CA's NM4 and Linker utilities, the spokesman noted. A new loader, linker and cross assembler are provided for customers with LSI 2 series systems.

Any of the Naked Mini intelligent cable controllers may be used for private I/O functions by the 4/105. The slave may be reset, interrupted and have slave control service functions performed from the host machine through I/O commands, the spokesman said. The slave can also interrupt the host and has its own on-board real-time clock.

The 4/105 costs \$1,990. CA's Naked Mini Division is at 18651 Von Karman, Irvine, Calif. 92713.

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expansion of any 3033 beyond the normal IBM limit to 10, 12, 14 or 16 megabytes.

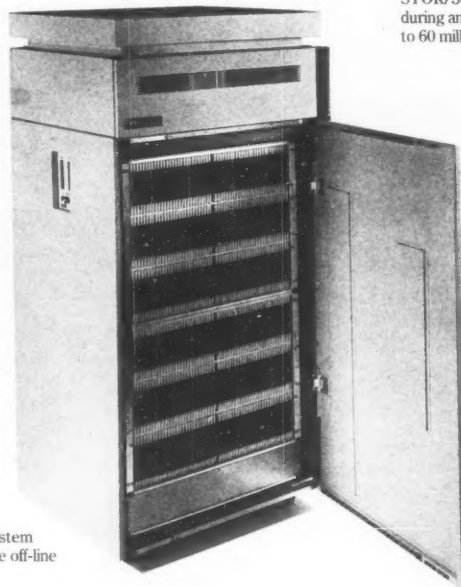
- Self-Exerciser—enables the field engineer to operate the system off-line prior to installation and during remedial maintenance without need for the CPU.
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Teachers Turn Student, Study Computers

By John Whitmarsh

CW Staff

SCARSDALE, N.Y. — School bells are ringing here for elementary, junior high and senior high school teachers who are going back to class to learn about computers.

The board of education in this New York City suburb has begun to train its 320 public school teachers in computer technology as the first step toward training the school system's 4,500 pupils. The program aims to introduce computers into the public school curriculum from kindergarten to 12th grade.

The job of training the teachers belongs to Prof. Robert Taylor, program director and adjunct assistant professor of education at Teachers College, part of Columbia University in New York. "Nobody knows yet what computers will mean for education," he said, "but we ought to begin with a broad-based approach to teaching children about these machines, and that means teaching the teachers."

Teachers are learning on four Apple Computers, Inc. Apple II and four Radio Shack TRS-80 microcomputers. Taylor reported that both systems worked well as instructional tools with the first 100 teachers, who wound up their eight-week course in April.

The program budget calls for the addition of four or five more of each machine next year — one indication of the program's success.

Taylor teaches only Basic at the moment. Teachers who learn their Basic lessons well and who are interested enough to continue may learn a second language, either Fortran on the TRS-80 or Pascal on the Apple II.

Taylor thinks he selected the right computers for both the teachers and their pupils. He chose the Radio Shack machines because of the company's marketing breadth and the Apples because "they have more to offer children in graphics and sounds. Children like to look and to listen. They enjoy a variety of sensory experiences and absorb a lot of visual output from TV."

The Scarsdale program is believed to be the first of its kind in the country. Some observers feel the attitude of future generations toward computers may depend on how well such teacher training programs succeed — or fail.

Three Roles

"We're trying to integrate computing into the educational program as a tool, a tutor and a device to be tutored," Taylor explained, predicting that the majority of

Scarsdale teachers will have completed some introductory computer training within the year. The teachers, in turn, will train their students as computers are installed. The board of education expects to have at least one computer in every school by September and one in every classroom within five years.

As a tool, the computer could be used for the storage of statistical data and the editing of manuscripts, including student papers and instructional materials prepared by teachers, Taylor said.

As a tutor, it would offer an interactive form of instruction, testing students while they study a lesson programmed into the computer.

In its role as a device to be tutored, the computer would encourage students to think out the problem at hand, whether the subject be mathematics, literature or social studies.

"In order to write a program, you have to know what you want the computer to do," Taylor said. "It's a way of learning how to think and to solve problems."

The teacher training program itself has had a problem or two, chiefly that of disinterest. "Learning about computers is fascinating, but it's also hard work, and some people simply are not interested. Others are too busy," Taylor said.

"But the response of those people who did participate was very favorable."

'Midas' High-Level Language, Relational Data Base Offered

CEDAR KNOLLS, N.J. — The Computer Systems Store is offering users a high-level language and relational data base called Midas.

Midas allows a user to program a multiterminal application in several weeks, thereby reducing software costs, the company claimed. Midas gives users multiterminal applications with a text editor, multikey indexing of files, report generation, high-level procedural language, the ability to read IBM-compatible tapes and dynamic creation of virtual records as well as interactive and batch capabilities.

Up to four terminals with function keys can be supported with a printer and a 10M-

or 20M-byte hard disk system.

Midas is available as a complete hardware/software system or separately as the operating system software only. The hardware/software system, which costs \$25,000, includes a 64K-byte S-100 bus microcomputer, rack-mounted with a 10M-byte hard disk subsystem; three serial ports; two Soroc, Inc. Model 140 terminals and a Centronics Data Computer Corp. matrix printer.

Midas alone costs \$2,200, which includes a disk pack, the SX100 security board and an operator's reference manual.

The Computer Systems Store is at 14 Ridgedale Ave., Cedar Knolls, N.J. 07927.

From \$8.4 Million in '78

Medical Micro Sales Rising

By Ann Dooley

CW Staff

LAWRENCEVILLE, N.J. — Medical practitioners purchased more than \$8.4 million worth of microcomputer-based hobby and small business systems equipment last year, according to a survey by the *Physicians Microcomputer Report*, a monthly publication.

The report also noted that user interest shifted from one set of manufacturers to another over the year, enabling some manufacturers, such as Radio Shack and Apple

Computers, Inc., to establish a significant user market, while others apparently suffered from diminished popularity.

On a unit volume sales basis for the first six months of 1978, the Radio Shack TRS-80 held 20.1% of the market, followed by Pertec Computer Corp.'s Mits Altair with 10.2% and Digital Equipment Corp.'s PDP-11/03 with 9.8% of the market.

Other systems purchased by the doctors and dentists surveyed included systems from Alpha Microsystems, Inc., which captured 8.4% of the market; Imsai Manufacturing Corp., which took 8.2%; Processor Technology Corp., 7.8%; Cromemco, Inc., 5.8%; and Apple Computers, 5.6%.

Other firms such as Commodore Business Machines, Inc., North Star Computers, Inc., the Digital Group, Inc., Xitan Inc., Heath Co. and Ohio Scientific Instruments, Inc. garnered between 2% and 5% of the market.

New purchases in the remaining six months of 1978, however, gave Radio Shack a 46.3% share of the market, which was gained at the expense of DEC, Pertec, Processor Technology and several companies with small shares of the market, according to the survey. The medical profession more than doubled its purchases from Apple Computers, moving that company into second place behind Radio Shack. Alpha Microsystems, Imsai and Cromemco showed no change in sales.

The results of the survey, which were based on direct mail questionnaires returned from more than 300 microcomputer retailers and 1,700 physicians and on manufacturer surveys, showed that 5.95% of the survey respondents currently own microcomputers.

(Continued on Page 36)

Macro Assembler Debuts for MCS-48

SANTA CLARA, Calif. — Version 3.0 of the macro assembler that permits assembly language programs to be written for the MCS-48 family of microcomputers has been introduced by Intel Corp.'s Microcomputer Systems Division.

The latest version of the assembler offers a 100% performance improvement over the previous version, an Intel spokesman claimed. A program that previously required 30 minutes to assemble now requires only 15 minutes, he said.

The nonmacro portion of Version 3.0 offers a 10% to 15% performance improvement over Version 2.0, he added.

Version 3.0 permits program development on the Intel microcomputer development system for all microcomputers in the MCS-48 family. These include the 8048, 8049, 8041, 8748, 8035, 8021 and 8022.

The MCS-48 assembler translates symbolic assembly language instructions pro-

duced by the programmer into machine code which can be executed by the microcomputer.

Output from the assembler is in standard Intel hexadecimal object code format. It can be loaded directly onto an ICE-48 module for integrated hardware/software debugging; it can also be loaded into the Intel development system for 8748 programmable read-only memory (Prom) programming using the Universal Prom Programmer and Universal Prom Mapper software.

Version 3.0 can be ordered under Product Code MDS-D48. The unit requires 32K bytes of random-access memory (RAM) for nonmacro use and 48K bytes of RAM for the macro facility.

The updated version is free to current users of the macro assembler, it costs \$850 to new users. Intel is located at 3065 Bowers, Santa Clara, Calif. 95051.

Medical Micro Sales Seen Rising 400% by 1979

(Continued from Page 35)

Physicians will continue to buy personal and small business systems more rapidly than previously anticipated, the report indicated. Sales in 1979 will range between \$24 million and \$36 million, nearly a 400% increase over 1978 sales levels, the report predicted.

Radio Shack is expected to increase its market share between 58% and 65% on a unit

volume sales basis, with Apple taking between 14% and 18% of the medical market.

The anticipated entry of Texas Instruments, Inc. into the microcomputer market will garner that company a 5% share by the year's end, the publication forecast.

In 1980, physicians and dentists will spend between \$84 million and \$96 million on microcomputer-related purchases, a 300% increase over

the projected 1979 sales.

The breakdown of the market by unit sales volume can be misleading, the report cautioned, since the various microcomputer-based systems can vary drastically in price. Low-end microcomputer systems range in cost between \$1,000 and \$5,000.

Most physicians who purchase these systems intend to increase their knowledge of hardware and software capa-

bilities and use the systems to perform some simple business and technical functions. A number of practitioners, however, are developing software for these systems in order to provide accounting and billing functions or to develop continuing medical education seminars on diskette.

Varying Software Quality

Medical business software of varying levels of quality has

been developed on microcomputers ranging in price from \$5,000 to \$12,000, the report noted. Basic functions such as medical billing, patient scheduling, aged trial balance, production reports and patient masters, for instance, have been developed for the North Star Disk Operating System, CP/M operating system, the Altair computer, the Alpha Micro Amos operating system and others.

However, as a result of insufficient mass storage and essential system software in the lower priced systems, medical business software has not been implemented on computers like the TRS-80, Apple or Pet, although there are exceptions, the survey indicated.

DEC's PDP-11/03, Data General Corp's Micronova and IBM's 5110, which cost between \$15,000 and \$35,000, are sold with some medical and dental business software and are installed primarily by small system houses, the survey noted. Although these systems have a small share of the market on a unit volume basis, their sales volume is high. Sales for 1979 in this category are expected to range between \$12 million and \$16 million.

Products will be introduced at a "torrid pace" during 1979, which the report predicted would be a transition year. Penetration of the small business market will increase drastically as a result of the mass production of inexpensive 16-bit computers based on the chip technologies of the semiconductor manufacturers, the survey noted.

A year's subscription to the monthly *Physicians Microcomputer Report* costs \$25 from P.O. Box 6483, Lawrenceville, N.J. 08648.



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Sees Shipments Cut in Half Intel Reeling From Impact of IBM 4300

SAN FRANCISCO — Knuckling under the impact of IBM's 4300 announcement, Intel Corp. has consolidated three domestic marketing units into one because it is anticipating up to 50% fewer shipments of Advanced Systems this year than it predicted earlier.

"We expected to ship 400 Advanced System models this year," John H. Clark, the firm's Data Products Group president, said, "but after first quarter results, the outlook for 1979 shipments instead ranges from 200 to 250 systems."

Chinese Get Data Base Gift

DENVER — Information Handling Services here has donated to the Chinese government a computer-based system that contains comprehensive data on 10 million products manufactured in the U.S.

The arrangement grew out of an invitation from the Chinese, who wanted to review various techniques for industrial modernization and world trade.

The system is a microfilm package of product catalogs from 15,000 American manufacturers and distributors, including the Fortune 500 companies, according to Edward M. Lee, president of Information Handling Services.

Developed by 450 specialists at the firm, the unit includes 950 cartridges, each with about 3,000 individual frames. Information is accessed through a two-volume printed index and displayed on a microfilm reader printer that can reproduce the data on paper.

Typically priced at \$22,000 the first year, the system must be updated every 60 days, Lee said, calling the gift "the largest repository of U.S. product information in the world," gathered over a 20-year period.

A representative of Lee's firm will install the system at a location selected by the Chinese government and will provide training for its use. Lee, accompanied by Secretary of Commerce Juanita Kreps, traveled to Peking to present the unit.

A division of Indian Head, Inc. of New York, Information Handling Services stores data on companies involved with vendor products as well as standards and specifications for various industries.

Attributing these less bullish projections to a 4300 backlash and to greatly increased availability of used IBM 370 computers, Clark noted, "We were faced with a decision in terms of reducing the structure we had built up to market and support 400 systems."

Along these lines, Intel has combined what were three individual Data Products Group marketing operations — the Computer Systems Division, Computer Peripherals Division and Software Marketing — into a single Computer Systems Division. About 100 marketing and administration employees were reportedly caught in the squeeze.

Only recently had Intel split its Computer Products Division into two operating divisions, Computer Systems and Computer Peripherals, to place equal marketing emphasis on both product lines [CW, March 5]. At that time, the firm wanted to sharpen its thrust into the growing market for stand-alone and IBM add-on peripherals.

Its latest about-face reorganization, however, is Intel's response not only to increased competition from IBM, but also to requests by customers to better define account responsibility within the firm's sales organization. At a recent Intel users group meeting in Chicago, "our customers were very vocal

about wanting to reduce the number of salespeople who have been calling on them," Clark commented.

Gerbman at Helm

Named president of the Computer Systems Division was Steven R. Gerbman, former president of the Computer Peripherals Division. T. Kendall Hunt, previously president of the old Computer Systems Division, will take the reins of Latin American and Far Eastern operations as vice-president of the Data Products Group. These operations formerly reported to Clark.

Other changes include a separation of marketing responsibilities along geographic rather than product lines "to put greater management concentration at the field level," Clark said.

Accordingly, Jerry T. Ungerman, former marketing vice-president for the Computer Systems Division, was named vice-president of Western operations. Eastern operations will be headed by Lawrence Haas, the previous vice-president of Computer Peripherals Division marketing.

And now merged with systems and peripherals, software will be marketed through Intel's systems support representatives, according to Clark.

Hardware, Software Industries Seen Beneficiaries of EFT Act

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The 1978 Electronic Funds Transfer (EFT) Act, intended to provide consumers with protection in EFT transactions, might eventually benefit the computer hardware and software industry more than anyone else.

That point of view was received favorably at a recent conference on the regulations proposed by the Federal Reserve Board to implement the 1978 law. The meeting, held here May 7 by the EFT Association (EFTA), featured a panel discussion by representatives of various EFT providers.

The EFT law could be called "the Hardware/Software [Industry] Relief Act," quipped Stanley Spilecki, executive secretary of the Savings Bank Association of

Connecticut. "IBM stock will soar."

Spilecki and others at the EFTA meeting said financial institutions face a very difficult task in restructuring their DP systems to bring the institutions into compliance with the proposed EFT regulations. Although sections of the law covering consumer liability in EFT transactions have been in effect since March, the bulk of the legislation does not become mandatory until May 10, 1980.

The "Fed" estimates it will have final EFT Act regulations by December, giving banks five months to upgrade their computer systems to meet the new EFT documentation, reporting and error-resolution requirements. Several panel members at the meeting, however, argued that five months may not be sufficient lead time.

(Continued on Page 40)

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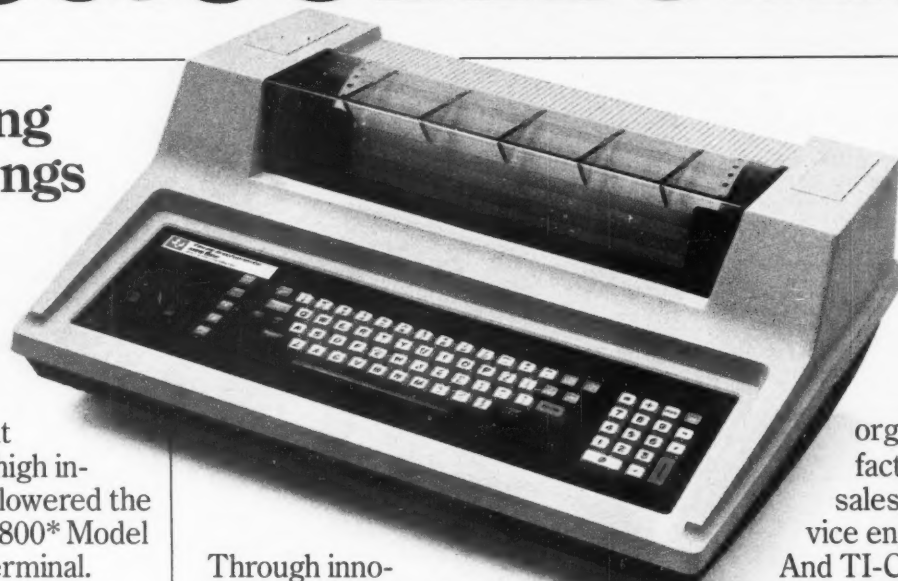
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AEA Asks Carter To Suspend Walsh-Healey Act

PALO ALTO, Calif. — Because of the gasoline shortage in California, the American Electronics Association (AEA) is urging President Carter to suspend the 1936 Walsh-Healey Public Contracts Act, which requires overtime pay for workdays longer than eight hours.

By suspending that law, defense contractors could allow employees to work a 40-hour, four-day week, resulting in a 20% savings on gas for transportation to work.

"Unhappily, the nation's 250,000 defense contractors and subcontractors are prevented from taking this sensible action," the AEA said in a telegram sent to the President recently.

The act allows for its suspension if the chief executive judges the suspension to be in the public interest.

Directory to List U.S. Software

NEW YORK — An *International Directory of Software* listing more than 4,000 products under 107 headings will be available early next year from CUYB Publications, Inc. here.

CUYB Publications is the recently established U.S. affiliate of Britain's Computer Users' Year Book.

The software directory will be dominated by U.S. products and marketed worldwide, according to Robert Grant, editor-in-chief. Computer manufacturers' software products tied to bureau usage will not be included in the reference book.

CUYB set a worldwide sales target of 10,000 copies following publication of the directory in January 1980. The firm expects demand for the book to parallel user demand for packaged software solutions.

CUYB is located at 150 E. 42nd St., New York, N.Y. 10017.

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Wescon Limits Exhibit Space

EL SEGUNDO, Calif. — Heavy demand for exhibit areas plus space constraints at San Francisco conference facilities have forced the Western Electronics Show and Convention (Wescon) to impose restrictions on exhibitors at this year's show, slated for Sept. 18-20.

The 1979 exhibit policy calls for Wescon's board of directors to limit the number of exhibiting companies, curtail the number of booths exhibitors may occupy and narrow choices for exhibit hall locations, according to William C. Weber Jr., Wescon general manager.

The board eliminated all exhibitor applications received after the March 5 cut-off date along with

those for which no deposit was received. In addition, directors will adhere to the Assignment Order Number List, a priority schedule based on longevity of exhibiting.

As a result, many companies accustomed to corner booth locations won't receive them this year, Weber said. Only those firms with priority numbers lower than 61 will be assigned main aisle corner booths in one section of Brooks Hall.

Restrictions are not confined to U.S. companies. Wescon directors also limited qualifying foreign exhibitors to the number of booths used in 1978 and excluded all U.S. government agencies from exhibiting at the September show.

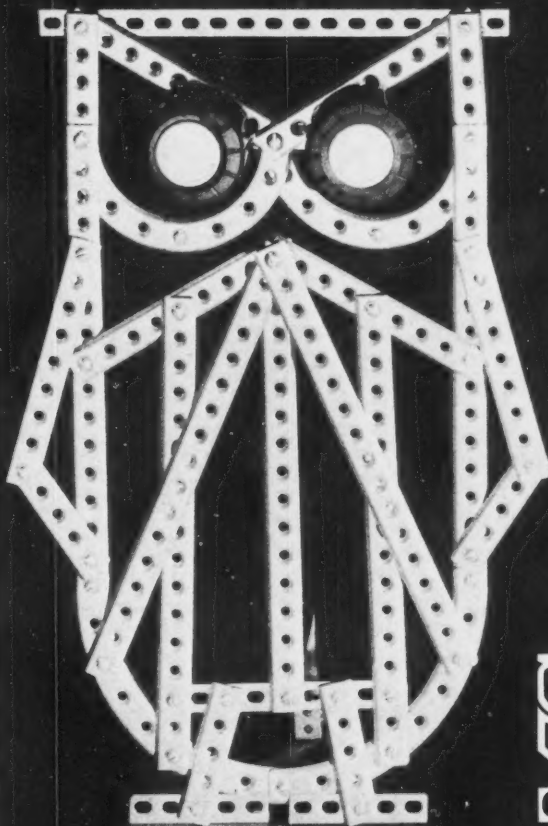
Weber emphasized that these restrictions apply only to the 1979 show and that exhibit areas are assured to the following applicants:

- Those exhibitors who signed a letter of intent for all three shows — Wescon and its sister events, Electro and Midcon.

- Exhibitors who took advantage of last year's "early bird" sign-up for Wescon '79.

To assist future exhibitors, Wescon will credit all companies applying for space in 1979 — whether or not assigned booth space — to allow them to retain or establish an Assignment Order Number for upcoming shows.

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We've put together the Online Programmers' Wish Book that tells you what you're missing by not using the O-W-L. It's free. Why not call or write us today for your own copy and, while you're at it, order the O-W-L system for a trial run. We'll ship both to you in the same box.



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Smart Processors, Multiplexers to Hit \$12 Billion

NEW YORK — The merger of data processing with data communications will boost the market for intelligent processors and multiplexers to \$12 billion by 1986.

This growth will follow a trend to computer networking that requires more specialized communications processors to relieve the mainframe of network control, a function that

can consume 50% of the host's processing power, according to a Frost & Sullivan, Inc. (F&S) study.

Clouding the long-term growth potential for the communications processor market, however, is AT&T's Advanced Communications Service (ACS), a networking system that will assume the network control function, F&S

cautioned. The study anticipates a \$400 million market for ACS by 1986, when sales for other network processors are expected to reach \$1.9 billion.

Currently competing for position in the communications processor business are some 40 companies, including mainframe and minicomputer vendors, independent suppliers of IBM-compatible equipment and custom equip-

ment manufacturers. Collectively, these firms market more than 80 different pieces of communications processing equipment, the report stated.

F&S holds out optimistic prospects for suppliers of IBM-compatible front-end processors that shipped about 21,000 units last year, a 16.5% increase from 1977 shipments.

As more computers are designed with data communications capabilities, line costs

will rise and spark a large demand for multiplexers which temper line usage.

Currently, line usage costs account for 40% to 60% of total network costs, or 13% of total data processing costs, a figure that will shoot up to 40% by 1985, the study predicted.

The market research report, No. 608, costs \$800 from F&S at 106 Fulton St., New York, N.Y. 10038.



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Hardware, Service Firms to Gain

(Continued from Page 37)

One panelist suggested there might not be enough software houses and consultants in the entire country to help banks make all the system changes that will be necessary because of the regulations. "The best investment I can think of is an investment in a software house," Spilecki offered.

Also of serious concern to the EFTA panel was legislation proposed by Rep. Frank Annunzio (D-Ill.) that would move up the effective date of the EFT Act. At recent hearings on the bill, Annunzio advised all EFT users to destroy their EFT cards until the consumer protection called for in the act takes effect.

Drew Tidwell, vice-president of the Consumer Bankers Association, does not believe Annunzio's bill will be passed by Congress, but he told the Efta forum that financial insti-

tutions can expect to be crucified in the press by the Illinois democrat until the law is implemented.

Call for Comments

On April 30, the Fed released a set of proposed regulations for the EFT Act and asked for public comment on the proposals by July 2. The Fed has also scheduled a hearing for June 18-19 "to receive views and information bearing on any aspect of the Act or rules to implement it."

After the initial public comments are received and considered, revised regulations will be issued for another 60-day comment period before the regulations are made final.

The proposed regulations cover the information that must be disclosed by banks to consumers on the terms of the EFT services offered, documentation to be provided to

EFT customers and error-resolution procedures to be followed by EFT providers when consumers complain of unauthorized or inaccurate transactions.

The regulations also cover, among other things, EFT record retention by financial institutions and the way in which banks must handle pre-authorized credits to consumer accounts, such as Social Security payments that are wired by the U.S. Treasury directly to the recipient's bank.

The proposed regulations appeared in the May 3 *Federal Register*. Lynn Barr, senior Fed attorney, told the EFTA meeting the FED expects to receive several hundred comments on the proposals.

More information on the regulations is available from Dolores S. Smith, section chief, Division of Consumer Affairs, Board of Governors of the Federal Reserve System, Washington, D.C. 20551.

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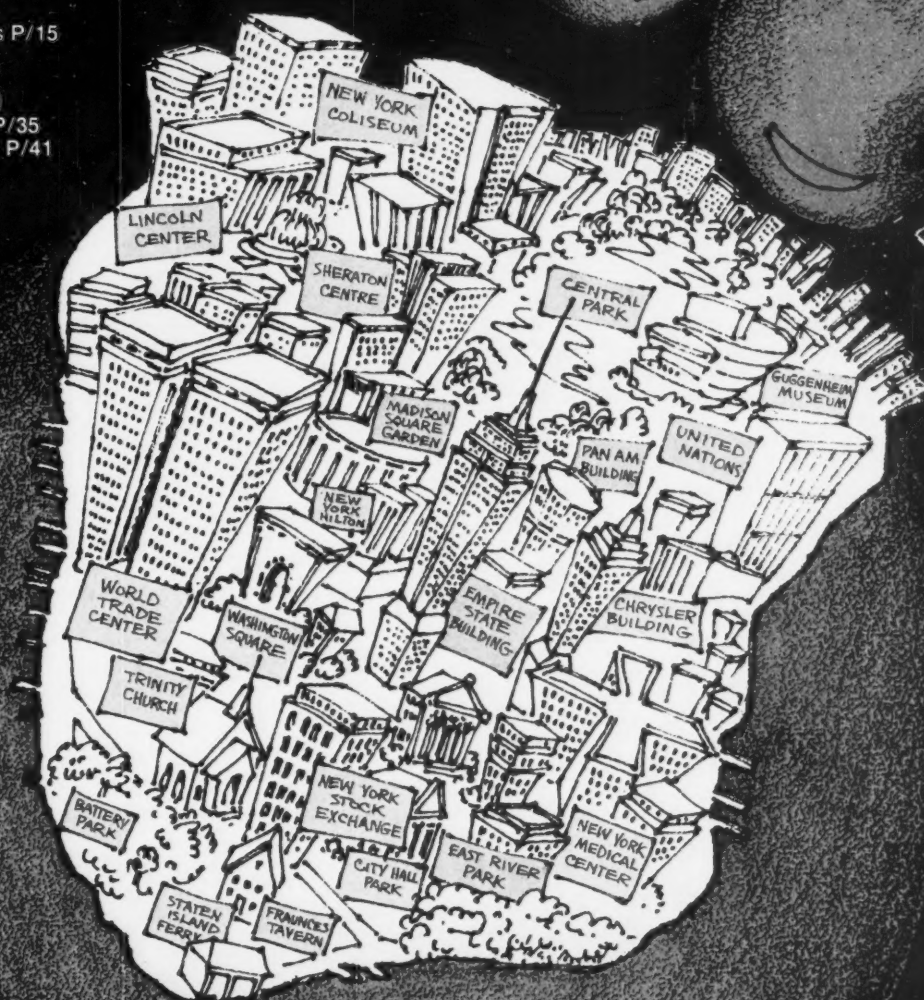
Varian Associates sold its Varian Graphics operation to Benson S.A., France, in exchange for a minority interest in the French computer graphics equipment supplier. Benson will operate Varian Graphics as a wholly owned subsidiary called Benson-Varian, Inc. that will market electrostatic printer/plotters and pen plotters in the U.S., Canada and the Far East. In March, Benson-Varian will move into new facilities in Mountain View, Calif.

Storage Technology Corp. (STC) agreed in principle to acquire Microtechnology Corp. for 69,000 shares of STC common stock, making the deal worth about \$2 million.

Facit-Addo, Inc., business equipment manufacturer, changed its name to Facit, Inc. to more closely identify the company with its Facit line of office products.

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NCC Turns the Big Apple Upside Down!

Better Than Ever, But Not Overwhelming

By Connie Winkler

CW Staff

NEW YORK — Merlyn G. Smith wants this year's National Computer Conference to be bigger and better than ever. At the same time, however, he doesn't want it to overwhelm the individual participants.

Smith has been dealing with the big questions of what the conference should be like for the past year and a half as NCC chairman. In fact, he has spent somewhere between one-fourth and two-thirds of his time on NCC and the remainder as manager of digital design at IBM's Thomas J. Watson Jr. Research Center in Yorktown Heights, N.Y. Smith has been with IBM for 26 years and manages design automation and computer-aided design groups.

Last year, 50,000 attended NCC in Anaheim, Calif., with about 10,000 actually participating in the sessions. Smith wants to boost the number of participants.

Registration this year is already running 20% to 30% ahead of last year, but Smith is not sure users will come to New York City to walk around the exhibits.

Solving Size Problems

To solve the size problem, more volunteers will be helping at the sessions and at the registration desks. More security people will be at the New York Coliseum to supply information and answer questions.

"We are tying very hard to be prepared for a lot of people," Smith said.

The Coliseum will be completely filled with exhibits, and 180 more will

be set up at the New York Hilton.

NCC '79 has already topped previous years, with 1,700 commercial booths representing 400 companies. "It's the first time the show has sold out in New York," Smith noted.

Although the highly technical sessions will continue to report on the state of the art, there will be more sessions on such issues as the social implications of computers, DP management and professional development. There will also be a Personal Computing Festival at the Sheraton Centre, formerly the Americana Hotel.

"I have tried to ensure a broader program on management and for the individual," Smith said.

"I am very excited by the fact that we

have a better program than ever. You like to feel that your conference in some ways is going to surpass all the others. I know it already has in terms of the number of exhibits. But it will be an educational conference for many more than before."

He added, "The Personal Computing Festival is going to be a lot of fun."

Trend Towards Split?

While Smith doesn't think NCC will be split into two conferences again, he does see a trend toward organizing separate conferences such as the one the NCC board is planning for March on office automation.

One of the problems with planning any conference is finding people to

help with all the work. In addition to the NCC staff, Smith estimates 150 volunteers are involved in setting up this NCC. Half of those people really enjoyed working on the conference and half were coaxed into helping. Coaxing is one of the chairman's jobs.

Smith got involved in NCC by a circuitous route. He was not a member of one of the sponsoring groups, but was a past president of the Computer Society of the Institute of Electrical and Electronic Engineers (IEEE), which is a sponsoring professional society of NCC.

Smith suspects he got the job of chairman because he was in the right geographic location for this year's NCC.

'Appropriate' Personal Computing

By Jake Kirchner

CW Washington Bureau

ARLINGTON, Va. — "Personal Computing: Is It Worth It?" is the theme of the 1979 National Computer Conference's Personal Computing Festival, which focuses on "appropriate" uses of personal computers, according to Festival Chairman Richard A. Kuzmach.

The four-day festival features some 35 technical and plenary sessions and a 139-booth exhibit in The Albert Hall of the Sheraton Centre Hotel (formerly the Americana). The festival is expected to draw approximately 40% of the NCC attendees, Kuzmach predicted, using last year's attendance as a model.

Kuzmach, an economist by profession, is a manager at the Mathtech, Inc. Division of Mathematica, Inc.

Show Highlights

During a recent interview, Kuzmach described some highlights of this year's personal computing show:

- "A hands-on applications center," sponsored by exhibiting firms where NCC goers can test the products shown in a "nonselling situation." This is a new feature, according to Kuzmach, which will allow attendees to try out the equipment without tying up the exhibit floor.

- A video theater featuring "several interesting segments made for television dealing with personal computing and related topics."

- Twenty personal computing demonstrators competing for prizes donated by exhibitors, including terminals, floppy disk drives, plotters and a TRS-80 from Radio Shack.

- A plenary session on Tuesday "to describe how it was" in the '60s, "when we didn't have large-scale integration to help."

- A second plenary session the same day entitled "The Coming Small Computer Earthquake," chaired by Burchenal Green, managing editor of *Creative Computing*, with Dr. Portia Isaacson, research fellow at Electronic Data Systems, and Ben Bova, editor of *Omnim Magazine*.

- A separate proceedings for The Personal Computing Festival.

The festival will include sessions on personal computers as an aid to the handicapped; personal computing in education, both in the home and at school; and the legal aspects of personal computing. Besides various technical sessions on hardware and software, there will be a plenary session on Thursday on the conference theme.

Find Right Roles

"There are a lot of roles that people talk about having computers do which just aren't appropriate, and there are a lot of good things that they could do," Kuzmach said. As an example, "I wouldn't use a personal computer to control my lights in my house or my thermostat. I'd get a black box for that. It might contain a microprocessor, but that's not personal computing."

Using a personal computer to do taxes is "not really appropriate either,"

(Continued on Preview/3)



Forget the Horror Stories

N.Y.: A Hell — and Heaven — of a Town

By Howard A. Karten

CW Staff

An old joke has a sales manager looking over a salesman's expense report and asking, "How could you have possibly spent \$45 a day on food in New York?"

"It's easy," the salesman answers. "You just skip breakfast and dinner."

Contrary to this joke and the bad press the Big Apple often receives, New York really can be a great place to visit — particularly if one is living in a hotel for only a few days. But the best way to enjoy New York is to forget all the horror tales you've heard and look for sights, sounds and tastes that are out-of-the-ordinary.

A little curiosity — and a bit of common sense — will go a long way to making a visit to New York memorable.

Crime, Buys, Food

First, the crime scene. Statistics (gathered and analyzed with computers, no less!) indicate that New York is, in fact, considerably safer than many other cities with better images. Would you go down to the docks in your hometown at night? (Visitors from Kansas and other landlocked areas can skip this question and go on to the next one.) No? Then don't do it here.

Similarly, although there are many great bargains to be had here, you should be suspicious of anyone offer-

ing to sell you a \$400 watch for \$40. Particularly if he has several on his wrist.

Visitors to New York have an opportunity to sample the finest cuisine in the world — and cuisines from nearly every part of the world. The list compiled by CW beginning on page Preview 6 will show, for example, Thai, Turkish, Brazilian, Vietnamese and Indian food. Restaurants are springing up — and dying — all the time, so it's a

good idea to check or call first.

Getting There

For getting around, the New York subway system cannot be beat — particularly in rush hour. Fighting the crowds at 42nd St. and Seventh Ave. is considered by some to be great sport and, after all, what visit to New York would be complete without this experience?

(Continued on Preview/6)

One-Day Event to Explore Help for Handicapped

By a CW Staff Writer

NEW YORK — "Computers for the Handicapped," a National Computer Conference session, will be held at the Sheraton Centre June 6 and is billed by one of its co-chairmen as a "human I/O conference."

The one-day event will feature demonstrations of computer aids that could improve a physically impaired person's ability to communicate with others and control his environment.

Presentations will be given by representatives from medical centers, universities, the National Aeronautics and Space Administration (Nasa) and corporations with an interest in advancing computers for the handicapped, co-chairman Leo Solomon said.

"For year, people have thought that some handicapped people were vegetables, when actually it's just a lack of input and output," he explained. "At the conference, we will show applications and ideas on ways of using whatever control they do have as an interface for communications through a computer."

All of the applications to be demonstrated at the conference are based on relatively inexpensive microcomputers such as the Radio Shack TRS-80 or Apple Computer, Inc.'s Apple II. Generally, off-the-shelf peripherals — available at most computer stores — are specified.

"None of these are multimillion dol-

(Continued on Preview/7)

With More Than 100 Topics

The Technical Sessions:

For the User

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Designed with the user in mind, the National Computer Conference's technical sessions program features more than 100 topics of practical interest to the DP professional, according to the program chairman for this year's show.

"I've worked on a lot of conferences, and this is by far the most user-oriented conference I have ever worked on," NCC '79 Program Chairman Dr. Richard E. Merwin said in a recent interview. A consultant on real-time computer systems and special-purpose languages, Merwin is also a research professor in engineering and computer science at George Washington University's School of Engineering here.

In putting together the show's 155-session technical program — which does not include the professional development seminars, the special "miniconferences" or the Personal Computing Festival sessions — Merwin said he was guided by a desire to produce "a broadly based show" with an emphasis on "quality" sessions and technical papers.

There was "a tremendous demand from people who wanted to put on a session," he said. "We had to put some pretty tight quality control" on the selection procedures. As a result, "I think there are a lot of things that ought to be pretty interesting to users."

He pointed to "Unions in Data Processing," "Why Managers Fail," "Training DP Personnel," "How to Improve DP Personnel Performance" and "How to Sell New Technology to Management" as the kind of sessions that will attract DP practitioners.

No Big Names

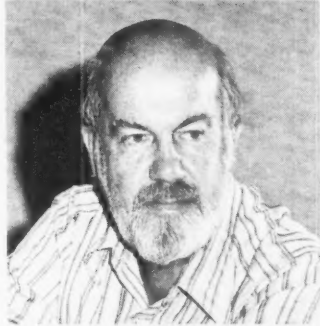
"One thing that's unique about this conference," Merwin noted, is that the program committee scheduled "no Herb Grosch, no Eugene Amdahl. We kind of went out of our way not to get the real big names this year. . . . We felt we would rather get people who had something they really wanted to say."

Because the show will draw primarily from the heavily populated area that stretches from Washington, D.C., to New England, Merwin predicted this year's NCC will be a big success, attracting at least as many people as last year's show did in Anaheim, Calif., where attendance neared 60,000. Advance registration is ahead of last year's figures.

As for attendance at the technical sessions, he said, "I think we'll probably do like we usually do — no more than three, four or five thousand."

"We've added one big feature this year that's completely unique, as far as I know," Merwin said in reference to the three miniconferences, which he feels should attract more using. He said the program committee made a special effort to attract doctors, lawyers and bankers to this year's show for the miniconferences, which cover computers in medicine, law and banking.

"What this will do, if it is successful, is greatly broaden the scope of NCC. We'll be getting people . . . in the technical sessions who normally only visit



Clockwise from the Apple: Merlin G. Smith, NCC conference chairman; Richard A. Kuzmach, chairman of the Personal Computing Fair; and Dr. Richard E. Merwin, program chairman.



the exhibits, if they come at all. We're essentially marching into new territory here."

Part of Long Campaign

If the show is marching into new territory here, it is only a small part of a long campaign for Merwin, who has been working on the program for the last year and a half. During that time he has also maintained his teaching schedule at George Washington and continued his work on a number of research projects for several organizations, including the Defense Civil Pre-

paredness Agency and the National Bureau of Standards.

Merwin's research is primarily in the area of microprogramming. He is also on the board of directors of the Institute of Electrical and Electronics Engineers Computer Society and a member of the Association for Computing Machinery.

Merwin began his DP career in 1946 working on the Eniac project. After receiving his doctorate in engineering from the University of Pennsylvania, he went on to IBM for 20 years, putting in time on the 701, 702 and 705

projects as well as serving as engineering manager of IBM's Stretch project.

Merwin was "loaned" to the Army in 1968 to work on the antiballistic missile project, and by the time he left the government in October 1977, he and his wife had caught "Potomac fever" and decided to stay in Washington.

It was about that time that NCC '78 Conference Chairman Merlin G. Smith asked Merwin to take on the task of putting together this year's NCC program.

"It's amazing how long it takes to get up to speed on this thing," said Merwin, who put together a committee and staff with a budget of approximately \$30,000. The group "had to filter through a tremendous amount of stuff" to put together the technical program from proposals "that came over the transom" and from suggestions put forward by the committee.

Merwin has been spending almost half his time working on the show since the beginning of the year. "I had no idea what I was getting into," said the man responsible for the program, all the program publications — including the 1,100-page proceedings — and the program publicity. "You can't imagine the number of phone calls, the harassment, the people angry because of this and that . . . Of course we dropped a lot of balls — you can't help it when you've got that big an operation."

But "when all is said and done, I must say that it's kind of interesting and that I've never done anything quite like this before. I wouldn't want to do it again," he said — adding, however, "I'm not sorry I did it."

"I think the conference is going to be quite interesting, and I think it should appeal to a broad base of users. After all, if you figure it costs somebody 60 bucks for a night in a hotel room in New York, what's another 70 bucks to come to the technical sessions?"

Fair to Focus on 'Appropriate' Uses

(Continued from Preview/2)

he continued. "It can do some of the arithmetic, but unless it's a really complicated program, it's not going to make the judgments about the various court cases and so forth that have been handed down as to what's acceptable and what's not as a deduction. The computer can't really do that very well . . . It can help, but it can't do what a lot of people are expecting it to do in that area."

On the other hand, some appropriate uses listed by Kuzmach are word processing; mailing lists; education for children — "both the more routine drilling kinds of things and educational games, games requiring thought and participation"; and recordkeeping in the home, such as "making plots of utility usage vs. cost and things like that."

Aim: Share Knowledge

Kuzmach said this year's personal computing show will concentrate on "the current issues in personal computing," highlighting applications. "Up until quite recently," he explained, "when someone with a personal computer told someone who wasn't into it

that he had a computer, the question was always: 'Well, what are you doing with it?' and the answer was always: 'Well, I will be — or it will be — able to do something.'"

"It's gotten to the point now where people can say: 'Oh, I've got it doing this and so now, and I can do this and that.' They've gotten to the point where [the computers] are being used; that's a change. And I think that's what has to be highlighted, so that we can share all that knowledge."

With that in mind, he said, there has been no attempt to make this year's festival appreciably bigger than last year, which was the first of its kind and therefore a "landmark," according to the festival chairman.

Early Computing Interest

Kuzmach's own interest in personal computing stems from "a working knowledge of electronics" he developed in grade school and which blossomed when he worked with computers in graduate school. He bought his first personal computing components in 1975.

Kuzmach was founder and president of the Chesapeake Microcomputer

Club, a group of people in the Baltimore-Washington, D.C., area involved in personal computing.

He estimates he has \$6,000 worth of computer equipment in his home. The system, a Z80-based Altair Software Development Co. 8800 with 56K bytes of memory, includes a "home-brew" console with a Sony 5-inch TV screen, a surplus keyboard, a cassette recorder and a completely home-designed and fabricated acoustic coupler.

In addition, "I've got 40K of memory sitting in boxes waiting to be assembled," he said, as well as some high-speed tape drives waiting to be hooked up to the system.

Although he is not a professional DPer, Kuzmach does use computers in his work and is a member of The Association for Computing Machinery. He has been working on this year's Personal Computer Festival since January 1978 with a budget of \$10,000.

Major goals this year were to make the exhibits more accessible to NCC attendees, he said, and to "integrate" the festival's printed schedule with that of the whole conference so people will be better able to schedule attendance at the festival.

8:30-10:00		Wednesday A.M.		10:15-11:45		2:30-4:00		Wednesday P.M.		4:15-5:45	
Mercury Ballroom NYH	Conducting the Trial: Evidence in Computer Crime & Fraud Cases Marianne E. Kussick	72	No Patents for Software? If So, What Now? John W. Bevinger	83	Software: An Idea Whose Time Has Come, Or Gone? John W. Bevinger	94	Health Data Center Issues Emer N. Gabriel	106	Legal Risk: Technical Decisions, Computer Experts & Business Sense Lawrence Robertson		
Trancon Ballroom NYH	Issues & Policy Concerns in Health Computing - Part II Ruam E. Pengor	73	Issues and Policy Concerns in Health Computing - Part I Ruam E. Pengor	84		95	Case Studies in Software Development Techniques J.E.K. Landstein				
Imperial Ballroom A SC	Quantitative Measures of the Quality of Programs & Systems Med Chapin	74				96	High-End Microprocessor Architecture Bernard L. Paulo	107	Database Design Shankar B. Navathe		
Imperial Ballroom B SC	Computer Graphics in the Building Industries Mary S. Cancian	75	The Impact of New A/D LSI Technology on Systems Rob Walker	85		97	Advanced Industrial Robotics James S. Abous	108	Advances in Computer Graphics Bertram Herzog		
Georgian Ballroom A SC	Fault Tolerant and Maintenance Systems Jacob A. Abraham	76	Testing & Fault Tolerance in Digital Systems Stephen Y.H. Su	86		98	Computers for the Chief Executive Officer Howard Lee Morgan	109	Data Processing's Proposition Issue Robert M. Sherrin		
Grand Ballroom East NYH	Improving the Performance of the Data Processing Professional Don B. Medley	77	How to Sell New Technology to Management Herbert B. Sanford	87		99	COBOL - Its Origin Henry Tropp	110	COBOL Retrospective Nancy Stern		
Grand Ballroom West NYH	Database Models Lorraine M. Duvall	78	Database Applications Gerard T. Capriato	88		100	Special Computer Applications Daniel J. Van Bieghem	111	Employing Handicapped Computer Professionals Roger L. Mins		
Royal Ballroom A SC	Simulation for Predicting Computer System Performance Brian W. Unger	79	Simulation for Predicting Computer System Performance Brian W. Unger	90		101	Selling Simulation Results John Kleider				
Regent Room NYH	Model Based Management Support for Distributed Data Processing Patrick W. McEgor	80	Experiences in Local Area Networking Ira W. Cotton	91		102	Network Security Gerard J. Fogel	112	Supporting Network Access to Data Stephen R. Krimbleton		
Georgian Ballroom B SC	Advances in Secure Operating Systems Technology in the Department of Defense - Part I Stephen T. Walker	81	Advances in Secure Operating Systems Technology in the Department of Defense - Part II Stephen T. Walker	92		103	Risk Assessment Techniques Steven Glasman	113	Sexual Barriers in Business & How to Overcome Them Ira W. Mason		
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Mercury Ballroom NYH	Information Privacy: Public Policy & Responsibilities Francis M. Gregory, Jr.	115	The International Privacy Debates, Licenses & Limitations Alexander D. Roth	126		116	Programming Techniques T.C. Weselkamper	127	Performance Modeling & Evaluation of Database Management Systems Larry Kestenberg	118	New Directions in Distributed Architectures Franklin T. Westervelt
Trancon Ballroom NYH	Implementation Factors in Hospital Information Systems David J. Mislovech					117	Communications Technologies: Their Impact on Computing David L. Mills	128	Data Dictionary Systems Henry C. Lekovits		
Imperial Ballroom A SC						119	The Expanding World of Service George O. Harmon	129	Computer Chess: The Next Decade Dennis W. Cooper	121	Computer Technology & the Movie Industry Suzanne Lanza
Imperial Ballroom B SC						120	People Power: The Key to Effective Management of Data Processing Projects Lorella A. Pichell			122	What Can Pattern Recognition & Image Processing Do for King Shun Fu
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Grand Ballroom West NYH						123	Computing in Developing Countries K. Varadan	133	Microcomputers in Technical Professional Development Raymond G. Fox	125	Computer Abuse in Universities Susan H. Nycum
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Royal Ballroom B SC						125	Computing in Developing Countries K. Varadan				
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Trancon Ballroom NYH						137	Time Management for EDP Professionals Hudson E. Henry	140	Computer Economics Roger W. Freestone	141	Computerized Control Systems for Automated Production Leonard B. Gardner
Imperial Ballroom A SC						138	Computer Economics Roger W. Freestone	141	Computerized Control Systems for Automated Production Leonard B. Gardner	142	Applications of Computers in Criminal Justice Systems Arthur B. Carroll
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Royal Ballroom B SC						153	Computing Speech Synthesis James Brodie	PC23	Special Topics	PC25	

Conference at a Glance

Professional Development Seminars
New York Sheraton Hotel

Tuesday 8:30 A.M.-4:30 P.M.

An Overview of Distributed Processing Burt H. Leibman, International Computing Company	Mercury Ballroom NYH
An Introduction to Microprocessors Rodney Zaks, Sytek, Inc.	Truon Ballroom NYH
Hands-on Microcomputer Software/Hardware Workshop Eric R. Green, Integrated Computer Systems, Inc.	Imperial Ballroom A SC
An Overview of Automated Office Technologies and Equipment Vincent C. Hatzino, Datapro Research Corp.	Imperial Ballroom B SC
Structured Systems Analysis Chris P. Garne, Improved System Technologies, Inc.	Georgian Ballroom A SC
Day of Renewal Bernard H. Perlman, Executive Management Renewal Programs	Grand Ballroom East NYH

Wednesday 8:30 A.M.-4:30 P.M.

Database Machines David K. Hsiao, Ohio State University	Grand Ballroom West NYH
A Practical View of Computer Communications Protocols John M. McDoulin, Bell Branch and Newman, Inc.	Royal Ballroom A SC
Hands-on Microcomputer Software/Hardware Workshop Eric R. Green, Integrated Computer Systems, Inc.	Regent Room NYH
Comparing Text Processing Packages and Systems Amy D. Work, Datapro Research Corp.	Georgian Ballroom B SC
Structural Systems Design Tish Sisson, Improved System Technologies, Inc.	Sutton Ballroom NYH
Criteria for Selecting Processing Environments James J. Joy, Joy Associates, Inc.	Royal Ballroom B SC

Thursday 8:30 A.M.-4:30 P.M.

Human Engineering in Teleprocessing Systems Thomas R. Bailey, TRB Systems	Royal Ballroom B SC
Recent Developments in Microcomputer Technology John H. Carson, Carson Associates	
Implementing a Word Processing System Robert M. Bloomfield, Marshall, Rodens & Company, Inc.	
Managing Structured Methodologies Edward Youdon, Youdon, Inc.	
Computer Systems Performance Jeffrey P. Bluen, BGS Systems, Inc.	

Separate registration required for each seminar
NYH - New York Hilton Hotel
SC - Sheraton Centre

Monday A.M.

Keynote Session 10 A.M., Grand Ballroom, NYH
John A. Opel, President, IBM

2:30-4:00 Monday P.M.

4:15-5:45

Plenary Session: Computers in Society 1:15 P.M.-2:15 P.M. Grand Ballroom East, NYH	
Regulation of Artificial Intelligence in the Computer Communication Marketplace Edward B. Sparack	1
Insurance Industry Automation Peter B. Walker	2
Software Performance Modeling & Analysis Arnold E. Goei	3
Impact of Future Technologies on the Computer Industry Robert Corbin	4
An Assessment of Future Computer System Needs for Large-Scale Computation Peter Lyons	5
Unions in Data Processing Richard W. Herfield	6
User Microprogramming of Microcomputers Joseph M. Austin	7
State of Art of Microcomputer Software & Distributive Processing Marvin Golan	8
User Assistance in On-Line Systems Richard L. Wexelblatt	9
Networks & Data: An Interim Report by the CODASYL Systems Committee Bernard K. Plogman	10
ICCP: A Call for Action Richard D. Spaniol	11
Practical Applications of Data Encryption Dunlap Hills	12
Technical Aspects of Privacy Protection in Transactional Data Systems Rena Linn	22
Determining the Value of Computer Applications Edward O. Austin	23

Personal Computing Festival

2:30-3:20

3:30-5:30

Verisales Terrace SC	Personal Computing Frontiers Software	The Coming Small Computer Earlquake Burckel Green	PC1	PC2
Regency Ballroom SC				
Regency Foyer SC				

8:30-10:00 Tuesday A.M.

10:15-11:45

Computers at Work in the White House: The Senate & the Federal Courts John K. Sweengren	24
Commercial Banking Automation William J. Deane	25
Designing Distributed Systems Dennis J. Harvey	26
The Interface Between Database Management Systems & Operating Systems Edward B. Sparack	27
Data Flow - Part I Jack B. Dennis	28
Power Management in the Computer Facility Robert R. Robbins	29
End User Training Building the DP Interface Vicki C. McConnell	30
Distributed Database Systems S. Bing Rao	31
Management's Challenge: The Office of the Future Frederick R. Amper Jr.	32
Emulation Laboratories & Experience Ingvald A. Eidridge	33
An Overview of Contemporary Networking Technology Dion R. Doll	34
Privacy & Security in the 80's H. Rex Harrison	35
Software Psychology: Exploring the Human Factor Ben Shneiderman	36
Evolution of the Computer Communications Market in a New Technological Era L. Dan O'Neil	37
EFT & Consumer Banking Automation Robert V. Saback	38
The Interface Between Database Management Systems & Operating Systems Edward B. Sparack	39
Data Flow - Part II Arnold E. Goei	40
Computer Facility Support Functions Robert R. Robbins	41
Why Managers Fail James F. Tossion	42
Relational Database Systems P. Bruce Reia	43
Benchmark Selection of Time-Sharing Systems Gerald W. Findley	44
Simulation Development Tools Arlon N. Silver	45
Measurement Phases of Computer Selection Sandra A. Marwick	46
Data Security George J. Davis	47
Social Effects of Computerized Conferencing Richard H. Hartz	48
Computer Communications & the International Data Manpower L. Dan O'Neil	49
International Banking Automation Derek G. Hall	50
Computer System Evaluation Victor L. Varnice	51
Dynamic & Reconfigurable Architectures Steven P. Karashev, Steven I. Karashev, C.V. Ramanamirthu	52
The Impact of Security & Protection on Computer Architecture Viggo D. Gjovig	53
Factors for Motivating DP Professionals vs. Other Jobs in the DP Department J. Duane Couger	54
Database Evolution Dennis McLeod	55
Planning Acquisition & Implementation of Microcomputer Based Business Systems Marvin Golan	56
Simulation of Industrial Processes J. Tatarage	57
Economics of Networking Norman R. Nielsen	58
Computer Security: Technology vs. A. vs. Audit Richard G. Wickert	59
Managing the Computer Security Problem Robert P. Campbell	60
Assessing Database Integrity in the Networking Environment Robert H. Thomas	61
Simulation Languages: State-of-the-Art & New Vistas Tucker J. Owen	62
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Dynamic & Reconfigurable Architectures Problems, Evolution & Applications Steven P. Karashev, Steven I. Karashev	64
Distributed System Control Architecture Daniel M. Schutzer	65
A Domestic Information Display System: Graphics for Decision Making in the White House & Congress Edward K. Zimmerman	66
Database Systems Architecture John L. Berg	67
The Information Officer: Fact or Fancy? James C. Emery	68
Simulation Languages: State-of-the-Art & New Vistas Tucker J. Owen	69
Assessing Database Integrity in the Networking Environment Robert H. Thomas	70
Managing the Computer Security Problem Robert P. Campbell	71

Plenary Session: Future Directions in Computing 1:15 P.M.-2:15 P.M. Grand Ballroom East, NYH

2:30-4:00 Tuesday P.M.

4:15-5:45

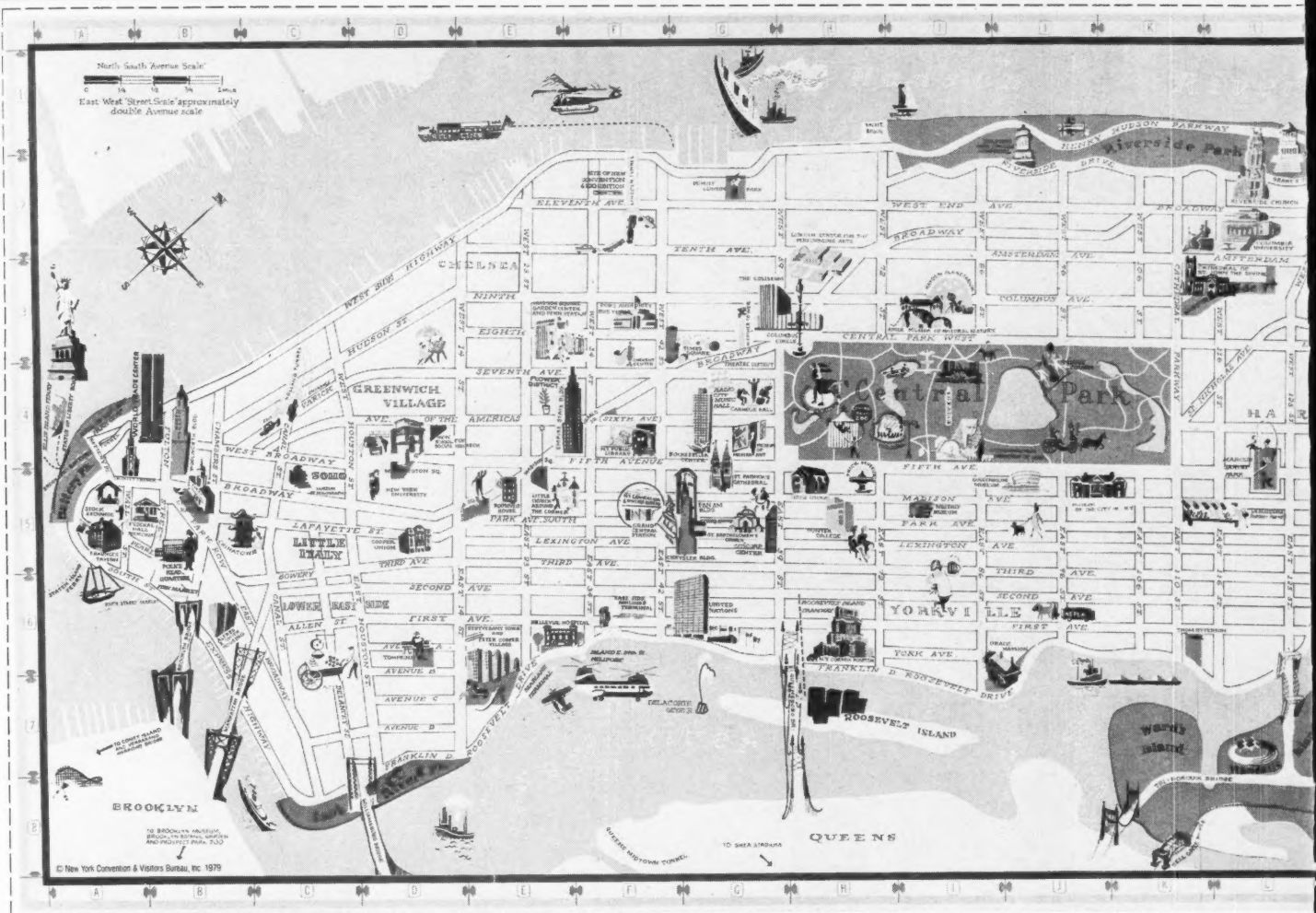
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Personal Computing Festival

2:30-4:20

4:30-5:30

Verisales Terrace SC	Personal Robotics Ritten Hols	PC3	PC4	PC5	PC6	PC7
Regency Ballroom SC	Small Business Systems: Experiences With Microsystems Don Bing & Bob Reimond	PC8	PC9	PC10	PC11	PC12
Regency Foyer SC	The Personal Computer in the Schools Lou Frenzo	PC13	PC14	PC15	PC16	PC17



A Hell — and Heaven — of a Town

(Continued from Preview/2)

Although subway maps are not always available at the change booths, maps are prominent in the stations and on the trains. A word of caution though: everyone in New York fancies himself an expert on the subway, but many are often wrong. So it's a good idea to get two or even three opinions on the best way to get to your destination.

This is not to slight the cab drivers in the city, who, while they may not always speak Oxford English or be elegantly attired, are usually adept at finding a destination. Most cabbies here — like drivers in any city — are hard-working, honest people who will not take you through the Bronx to get from Mid-Manhattan to Brooklyn.

(There's another old joke about the chap who gets into a cab and asks to be taken to London, England. When the driver is assured that this need not entail going to Brooklyn — "I never go to Brooklyn," he says — he agrees to go. On arriving in England, he works the London streets for a while, until an Englishman gets into his cab, asking to be taken to Brooklyn. "Sorry, I don't go to Brooklyn," our man replies.)

(Cab drivers are required to take you anywhere within the city you wish to go, so you shouldn't take no for an answer.)

'Street Theater'

And speaking of cabs, don't be put off or dismayed by the drivers' language; it's all part of the game, and no one who has ever reported verbal

pyrotechnics leading to fisticuffs has ever passed a polygraph with that story.

The language of cab drivers and others is part of the color of New York. This is the greatest city in the world for what is sometimes termed "street theater" — i.e., simply watching New Yorkers do their thing.

Unless you want to spend \$20 or more for a seat in the theater, you can derive much entertainment from just walking around, watching New Yorkers going through their normal activities. These include assorted street hustles like the aforementioned watch ploy — referred to in some circles as the "it-just-fell-off-the-truck" bit or (really!) the old shell game.

Most New Yorkers will watch with amusement and tolerance without getting involved. This is good behavior to emulate: if left alone, even the most eccentric residents are quite harmless.

Keeping Informed

This city is a media capital, with more than a dozen television stations, radio stations too numerous to count and newspapers, books and magazines from your hometown and elsewhere. The newsstand at Times Square, for example, carries papers from every major city in the world.

Another source of comfort may be a telephone number called the "New York Cityphone" — 675-0900. The resourceful people on the other end have been able to answer almost any question about any activities (that are legal) in the city. The service operates from

10 a.m. to 6 p.m. each day and welcomes calls from visitors or residents seeking information.

A similar service — though not always as informative as the Cityphone — is offered — at the New York City Visitors and Convention Bureau across from Grand Central Station on 42nd St.

Looking Around

Sightseeing, of course, is a favorite activity in this city, which has more landmarks per square mile than almost any place else. Almost any guidebook has a listing; one that might be of particular interest to DPers is the New York Museum of Holography on Mercer St. (925-0581), open from noon to 6 p.m. Wednesday through Sunday.

The museum has several different types of holograms on display, as well as guidebooks and other materials.

And, of course, there are the standard New York tourist spots: St. Patrick's Cathedral, the Empire State Building, Bloomingdale's, Zabar's . . . Buildings are going up all the time, and visitors should remember not only to look left and right, but also up and down, lest they miss something interesting and unusual.

In sum, New York is a fascinating, friendly — though admittedly different — place, and the amount of enjoyment you get out of the visit (between NCC sessions, of course) will be proportional to the amount of effort you put into it.

Karten fled New York six years ago.

Restaurants

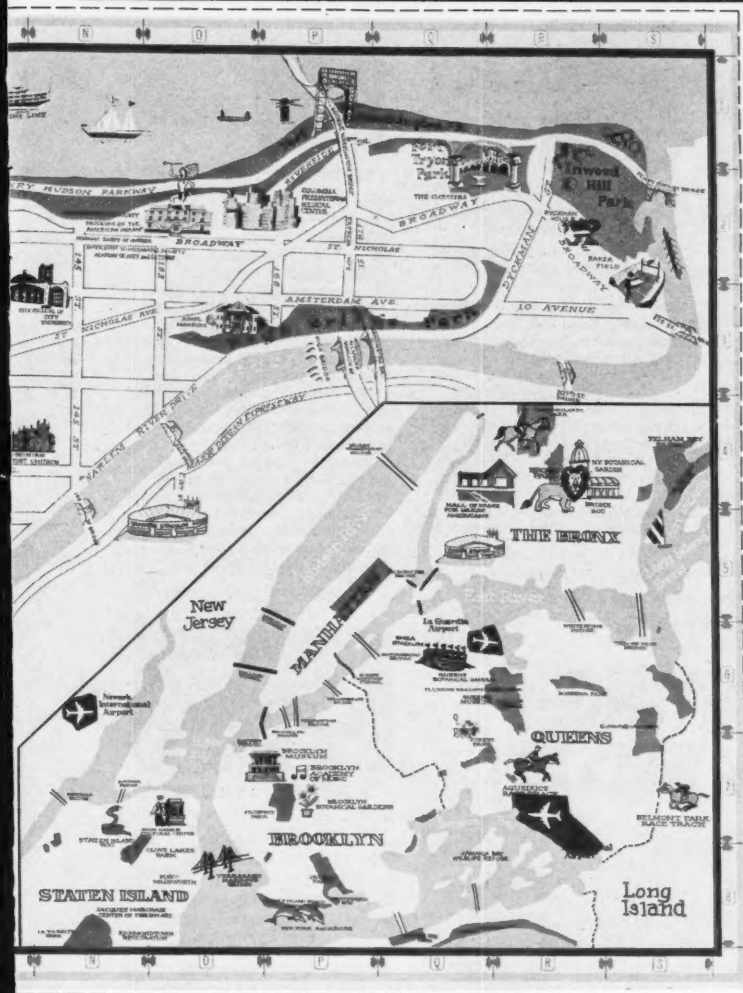
NEW YORK — Extensive research conducted by *Computerworld* Staffers has turned up an alarming fact: there is no computerized data base of New York restaurants.

So, as a public service, CW New York correspondent presents the choices of Mimi Sheraton and Gael Greene — both noted restaurant critics — and the New York Convention and Visitors Bureau.

Taste Treats Near Coliseum

Cafe des Artistes, 1 W. 67 St., 877-3500. New York Times restaurant critic Mimi Sheraton's favorite for "Old World artfulness of its setting" with only decent food. Where she takes out-of-town visitors.

Tavern-on-the-Green. Central Park West and 67 St., 873-3200. Pleasant surroundings in the midst of Central Park — owned by the same restaurateur who owns the more famous



There's Always Something To See or Do in Big Apple

NEW YORK — "East Side, West Side, all around the town..." the sights, sounds and smells are strictly New York. And whether you're a first-timer or a frequent visitor, there's always something new to do or see — and many are free.

One of the more obvious adventures is a ride on the Staten Island Ferry. The 20-minute cruise across New York Harbor costs only 25 cents and gives riders a fabulous view of the Manhattan skyline.

For a more complete view, the Circle Line offers a three-hour sight-seeing cruise around the whole island. Details can be found in your hotel.

The World Trade Center, in lower Manhattan, offers visitors an observation deck with "staggering" views of the island — it's open from 9:30 a.m. to 9:30 p.m. Atop the other tower is Windows on the World — a restaurant you need to book at least two weeks in advance. But no matter, you can visit the lounge without a reservation, have a drink and a snack and enjoy the same view.

Other landmarks include the Statue of Liberty and the Empire State Building. If you've never climbed the stairs that form the spine of that Great Lady or sped up the 1,250-foot tower of steel, limestone and aluminum, why not do it this trip?

Rockefeller Center offers a comfortable place to watch people, dine outdoors in the Promenade Cafe or stroll

along the lovely Channel Gardens. It's at Fifth Ave. and 47th St., within walking distance from the Coliseum.

The United Nations at First Ave. and 42 St. is not only interesting for what goes on, but also for the exhibits of art work by some of the world's foremost painters and sculptors. Don't miss the stained glass windows designed by Marc Chagall.

As for museums, New York enjoys an embarrassment of riches. The Metropolitan, the Natural History, the Museum of Modern Art, the Whitney and the Guggenheim are all a few blocks from the Coliseum.

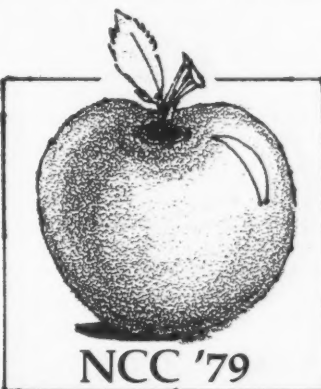
If you just want to stroll through a park, head for Central Park. You'll see folk dancing, horseback riding, picnicking — not to mention the vest-pocket parks every few blocks.

New York is synonymous with theater — and today, theater is everywhere — off-Broadway and on, at Lincoln Center and down in Greenwich Village. For half-price tickets on the same day of the performance, check the Theater Development Fund's TKTS booth at 47th St. and Broadway.

As for charming, famous neighborhoods, one should not miss Chinatown and Little Italy — two old and completely different cultures living harmoniously side by side in lower Manhattan.

And don't forget Greenwich Village and Soho. The village provides the arts with an historic setting, filled with gracious old landmarks, fine restaurants and shops. Soho's lofts and warehouses have been turned into smart galleries where the works of its residents are displayed for sale.

Finally, if you have only an hour to spend, treasure-hunt along Fifth Ave. or on the first floor of Bloomingdale's. Or browse the antique shops and boutiques along the Upper East Side or down in the Village. Shop for bargains on colorful Orchard and Delancey Streets in lower Manhattan.



for Dining, Noshing

Maxwell's Plum on the East Side.

Museum Cafe, 366 Columbus Ave. at 81 St., 724-7509. Sidewalk cafe popular for Sunday brunches. Behind Museum of Natural History. Near up-and-coming shops on Columbus Ave.

Nirvana, 30 Central Park South, 752-0270. Wonderful view of Central Park, but go for the food, too. No matter where you sit, mirrors give you constant park view. Phonebook touts it as "Nirvana on Rooftop, Bangladesh, India, Pakistan International Gourmet Restaurant." Complete dinner \$10 to \$15. No credit cards.

Gaylord's Indian Restaurant, 58 East 58 St. between Madison and Park, 759-1710. Based in London with restaurants in San Francisco, Tokyo and Hong Kong. Specializes in Tandoori chicken. Open from 11:30 a.m. until 11 p.m. A favorite of CW Managing Editor Nancy French. Get your fortune told for \$5.

Alfredo's Restaurant, 240 Central Park South, 246-7050. Famous Italian. Expensive, but good.

The Ginger Man, 51 W. 64,

399-2358. Nice, nearby, but expensive. Pre-Prohibition decor. After-theater menu.

Russian Tea Room, 150 W. 57 St. between Sixth and Seventh Aves., 265-0947. Reasonable prices; pleasant pink and green surroundings where the Christmas decorations are up all year. Nureyev is said to dine here. Borscht is supposed to be best.

Rikyu, 210 Columbus Ave. near W. First St., 799-7847. Pleasant and reasonable Japanese restaurant. It's safe to eat the sushi and sashimi (raw fish).

Monk's Inn, 35 W. 64 St., 874-2710. Partake of Old European cuisine in Medieval atmosphere and be served by monks in robes while dining to candlelight and classical music.

Top of the Park, One Gulf & Western Plaza, Central Park West at 60 St., 333-3800. Romantic restaurant 43 floors above New York overlooking Central Park, New York, Hudson River and New Jersey. International menu at moderate prices according to guide book. Reservations required.

Yummy Uptown, Chinese Style

New York Magazine's restaurant critic Gael Greene earlier this year scoured the city and found favorite Chinese restaurants almost every place but in Chinatown.

Shun Lee Palace, 155 E. 55 St., 371-8844. "If there were to be only one Chinese restaurant in town, I'd do voodoo to make sure it was Shun Lee Palace," Greene said. Best Peking duck in town at \$21, she raves.

Fortune Garden, 1160 Third Ave. near 67th St., 744-1212. New place on fashionable East Side. Greene's second choice.

HSF, 578 Second Ave. near 32 St., 689-6969. A spin-off of famous Hee Seung Fung on the Bowery in Chinatown. "HSF soars with its dim sum," small dumplings filled with meats and vegetables; great for lunch.

(Continued on Preview/67)

Event Planned On Disabled

(Continued from Preview/2)

lar systems," Solomon observed. The systems are portable, and many feature 5-100-type computers with analog-to-digital boards for converting for computer use whatever input an impaired person can make to communicate or control a function.

Ira Laefsky of the University of Pennsylvania will demonstrate a microprocessor-based communications and environmental control system for severely handicapped persons. The device measures electricity generated by the eye muscles and indicates what the eye is looking at on a screen displaying letters of commands.

Michael Levy will demonstrate Lexicon Corp.'s enhancement for its electronic translator. It works like an electronic "dog tag," displaying the user's name, address and whatever else might be helpful in an emergency.

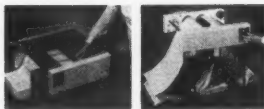
These and other discussions and demonstrations start at 8:30 a.m. and will continue until "everyone is satisfied that their questions have been answered," Solomon said.



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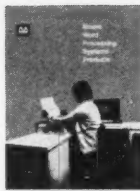
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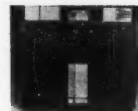


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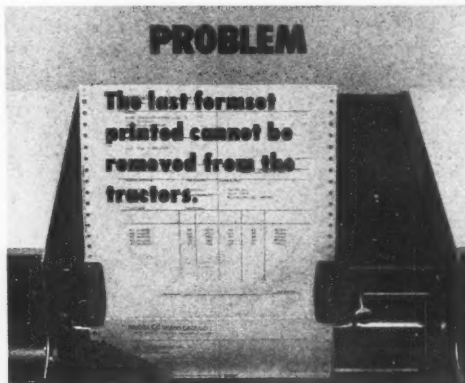


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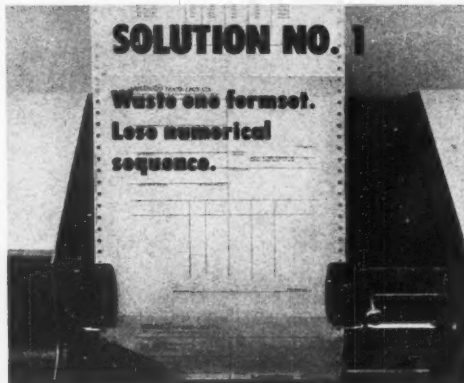
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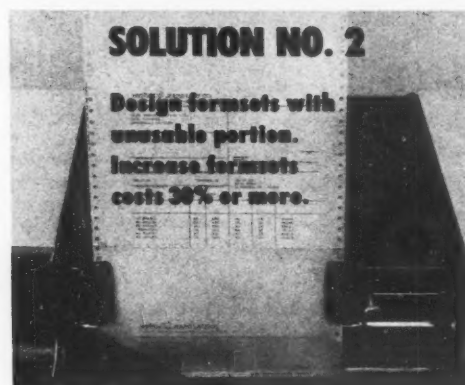
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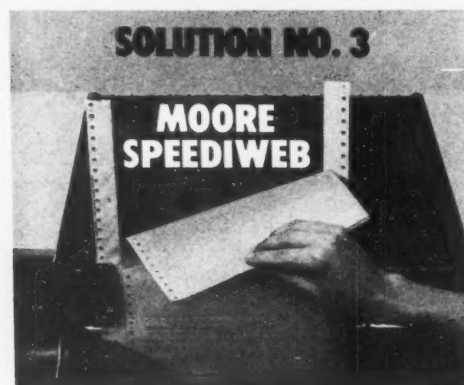
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Software at NCC

Processor Technology Corp.



NEW YORK — Four financial management and business-oriented software packages and two disk storage systems from Processor Technology Corp. will debut in Booths 4048, 4050, 4052 and 4054.

The firm's General Ledger software package is a bookkeeping system that maintains data on all accounts on a monthly basis for 24 months, while storing budget figures for 12 months, according to the firm.

General Ledger data need only be input once for automatic transfer from receivables, payables and payroll into the general ledger program. The system closes income and expense accounts to retained earnings at year-end.

The package features an automatic audit trail showing printed reports of all transactions, enabling the user to trace an item to the source document.

Reports produced include chart of accounts, worksheet trial balance, source journals and audit trail control reports.

The Accounts Payable software package records all incoming invoices and due dates by vendor and automatically prints outgoing checks, making appropriate deductions to payables.

The package prepares financial reports usable for planning cash flow requirements and lists outstanding invoices according to the last possible due date each week.

It also gives a picture of the schedule of payments, focusing on discount opportunities with discount date, amount and final payment date.

An aged trial balance sheet reviews monies owing and an aged cash requirements report breaks out monies owed according to the due date.

Featured in the Accounts Receivable package is a customer master file that records all information regarding balances and sales history. With this package, all invoices are automatically entered into the computer and posted to receivables. Payments and/or adjustments are posted against the invoices as received.

A month-end processing feature initiates the balance forward process wherein all invoices with nil balances are removed, leaving only outstanding invoices.

Upon request, the Accounts Receivable package produces customer statements, aged trial balance reports and exception reports and offers advice on customer credit limits.

The General Ledger, Accounts Payable and Accounts Receivable pack-

ages are compatible with each other, yet can be used separately. The accounting package requires 64K bytes of memory, according to the firm.

A fourth new software package, called Mail Master, allows the operator to use one to three disks for a listing of 1,500 to 5,000 names. Entries can be located within two seconds, can be updated, added on or deleted.

Groups of entries sharing specific characteristics may be deleted or printed. Selected groups of entries may be printed either alphabetically or by Zip Code.

As for hardware products, the company will introduce Helios I and V, which are disk storage systems based on a shared memory peripheral controller. Helios I is a double-density, dual minifloppy system in a desktop enclosure.

Using 1K sectors, the formatted capacity of a double-density mini diskette is 175K bytes.

Helios V is a hard disk system packaged in a rack-mountable enclosure. The controller incorporates a peripheral processor, an 8039 microprocessor allowing most of the disk processor's work to be carried out independently of the CPU.

Processor Technology Corp. is located at 7100 Johnson Industrial Drive, Pleasanton, Calif. 94566.

Battelle Memorial Institute

NEW YORK — Representatives from Battelle Memorial Institute will be here in Booth 3100 to discuss Basis, its data base management system.

In operation since the early 1970s, Basis has recently undergone enhancements to make it competitive with existing products, the institute said.

Basis is an information storage and retrieval system that offers users the ability to define applications and begin loading data within a few days. No computer programming is required for most implementations, the institute said.

Basis provides an Ansi-standard thesaurus, procedure files to capture user interactions, an on-line report writer, an on-line data entry processor and on-line sorting capabilities.

Searches are performed through use of an invested index or through actual data records, the institute added.

The system permits the user to enter search terms as well as search by proximity and numeric ranges, Battelle said. It also allows scanning the text records for terms, searching by prefix, mapping related fields together, searching by hierarchy and universe and using the full complement of Boolean logic on retrieved document sets.

Basis is presently available on several mainframes, including IBM, Control Data Corp. and Univac machines as well as the Digital Equipment Corp. Decsystem-10, Decsystem-20 and VAX-11/780. It can handle multilingual applications, alphanumeric data and very small or very large data bases, Battelle said.

Olive, its on-line entry and validation component, allows the user immediate access to the data base for alterations.

Basis costs \$38,000 to \$100,000 depending on the components selected.

The Basis Coordinator at Battelle Memorial Institute, 505 King Ave., Columbus, Ohio 43201 can provide more details.

Cullinane Corp.

NEW YORK — Cullinane Corp. will feature three new software support products in Booths 2702 and 2704.

The OLQ 2.0 is an English language query facility that is integrated with the Cullinane Integrated Data Base Management System (IDMS) and Integrated Data Dictionary, the company said. On-line/Query features include multiple record retrieval (users can retrieve multiple records in a single operation), QFILE storage (allows storage of preestablished OLQ commands in the data dictionary for use by end users) and DBKEYLIST (sifts out desired records for a given report).

The IDMS/DC teleprocessing monitor is integrated with Cullinane's data base management systems. IDMS/DC offers application programmers an integrated recovery facility, mapping support and storage protection capability. It supports IBM 3270 and 2741 and Teletype terminals.

IDMS 5.0 is the latest version of Cullinane's data base management. It offers users both automatic recovery and automatic rollback facilities, improved journaling and archiving and increased integrity. It is also reentrant and multithreaded.

Cullinane is located at 20 Williams St., Wellesley, Mass. 02181.

See Us at DECUS June 5-8

DECsystem-10

DECsystem-20

DPL

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Name _____
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Hardware _____

Software at NCC

McCormack & Dodge Corp.

NEW YORK — The Plus series of financial software products will be the highlight of McCormack & Dodge Corp.'s display in Booths 4807 and 4809.

The series includes G/L Plus On-Line, A/P Plus, P/O Plus, F/A Plus and CPA Plus. G/L Plus On-Line is an extension of the firm's General Ledger/Financial Analysis System and allows users to inquire into the general ledger master file as well as to enter and edit journals on-line.

In addition to standard accounting operations, G/L Plus also has budgeting, modeling and planning capabilities. It is available for \$38,500 to \$42,500 depending on options.

A/P Plus, an automated accounts payable information system, is said to be a multicorporate, multibank system to help automate the disbursement process from the receipt of the invoice through the issuance and reconciliation of remittance checks.

Features include multiple and selective corporation and bank processing in a single check run, cash management reporting and an employee travel module. It is available for \$25,000.

P/O Plus prints purchase orders and provides status reports on open and

overdue purchase orders. The system also projects long-term cash requirements from the data purchase orders.

It can also be used to evaluate vendors based upon user-specified tolerance ranges for price, quality and delivery. It is priced between \$6,000 and \$18,000.

F/A Plus, a new release of the firm's Fixed Asset Analysis and Accounting System, performs a range of fixed asset accounting and reporting functions for both financial recordkeeping and tax purposes. Priced at between \$18,000 and \$25,000, it features the

maintenance of multiple sets of tax books, lease reporting capabilities and a report writer that has been upgraded. It can be implemented in multicorporate environments.

CAP Plus, the Capital Project Analysis and Accounting System, consists of two parts, investment analysis and project tracking. Carrying a price tag of \$12,000, the system provides information for analyzing, measuring and then budgeting investment projects.

McCormack & Dodge Corp. is headquartered at 560 Hillside Ave., Needham Heights, Mass. 02194.

Alltax

NEW YORK — Alltax, a division of Management Science America, Inc. will introduce its newest software product in Booth 4706.

The Alltax Reporter is a companion system to the Alltax Taxing system, which calculates and maintains payroll withholding taxes.

The Alltax reporter will:

- Create magnetic tapes for federal, state and local tax and quarterly state

unemployment security information.

- Produce federal, state and local tax and quarterly state unemployment wage reports.

- Furnish audit reports to verify information before generation.

- Interface with the user's payroll system.

- Allow users to define report sequencing such as employee name or number of Zip Code for bulk mailing.

The price for the Alltax Reporter is \$4,750; the annual maintenance service is \$600.

Management Science America, Inc. is located at Suite 1300, 3445 Peachtree Road N.E., Atlanta, Ga. 30326.

National Technical Information Services

NEW YORK — The U.S. government will be represented in Booths 1433 and 1434 by the Department of Commerce's National Technical Information Service (NTIS), which will demonstrate some of its software services.

Two of the most popular of those services are the Cobol and Fortran compiler validation systems, NTIS said. The Cobol service is available on magnetic tape for \$550 and carries the order number AD/A-046 600.

The Fortran service, order number AD/A-062 036, is available at \$450 on tape.

The agency also offers an Environmental Protection Agency air pollution model that is called Users Network of Applied Modeling of Air Pollution (Unamap, Version 3). It is priced at \$350 and carries the order number PB-277 193.

NTIS will also display a series of directories which list computer applications in several disciplines and subject areas. The government-developed applications are available to users.

NTIS is at 5285 Port Royal Road, Springfield, Va. 22161.

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Dennison
Industrial Systems

SAS Institute, Inc.

NEW YORK — A statistical analysis system, SAS, will be displayed in Booth 429 by SAS Institute, Inc.

SAS can provide statistical analysis techniques for data collection and organization, summarization and reporting. It offers file-handling capabilities and programming capabilities to make SAS a data management system, the firm said.

SAS can process variable or fixed-length records, multiple record types and hierarchical files. It provides formats for reading data in any notation from any input device.

More than 50 statistical procedures are available in the SAS procedure library.

brary.

The SAS language can be used by nonprogrammers, according to the firm. It can be installed on any IBM 360, 370 or equivalent system running under OS or OS/VS. It requires a 150K-byte region and can be run in batch or interactively under TSO.

SAS also automatically generates formatted data listings, summary statistics, frequencies and cross-tabulations.

SAS is available on an annual license at \$4,500 for the first year and \$1,500 for each subsequent year from SAS Institute, Inc. P.O. Box 10066, Raleigh, N.C. 27605.

Wintek Corp.

NEW YORK — Wintek Corp. will display its floating-point arithmetic/scientific function package for the Motorola 6800 microcomputers in Booth 4022.

The Wintek package operates on nine-digit BCD values. Addition, subtraction, multiplication and division are included in the arithmetic operations, while 16 scientific functions are also available.

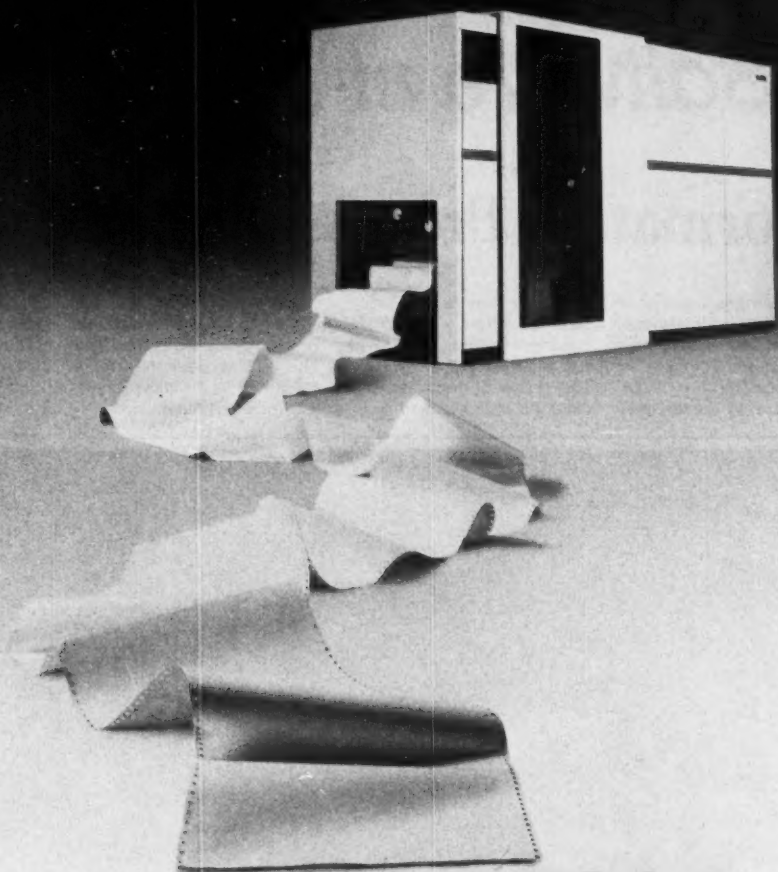
The package is written in 6800 assembly language and is supplied on either 7- or 9-track tape in both source form with comments for use with the Wintek 6800/6801 cross-assembler

and in relocatable object form for use with the Wintek cross-linker.

The argument passing and calling protocol conform to the standard Wintek PL/W high-level language calling sequence, allowing use with either PL/W or assembly language programs.

The price of the floating-point package alone is \$500. The complete Wintek cross-software package for the 6800, including PL/W compiler, cross-assembler, cross-linker, simulator and floating-point program sells for \$3,400.

Wintek is located at 902 N. 9th St., Lafayette, Ind. 47904.



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fewer, less sharp turns and fewer stations. As a result, loading time is improved dramatically, making more time available for printing. And reliability is improved by reducing the possibility of paper jams. A larger page buffer and additional buffer space not only enhances operating speed, but provides more flexibility in customizing multiple copies for different users. And for greater operational versatility, ITEL's 7800 provides four writable character generation modules as a standard feature instead of two. In addition, efficient design allows the 7800 to occupy about 20% less floor space than the 3800.

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equipment. We back the 7800 printer, and all ITEL products, with the same kind of full service support that has helped establish our reputation for quality and professionalism in every facet of the data processing industry. Because we're out to protect your computer investment—now, and in the long run.

For further information, contact ITEL Corporation, Computer Peripherals Division, One Embarcadero Center, San Francisco, California 94111, (415) 955-0391.

ITEL

Software at NCC

Information Processing, Inc.

NEW YORK — Information Processing Inc. (IPI) will announce Version 3.2 of its Blis/Cobol multiuser operating system in Booths 419 and 420.

IPI personnel will be on hand to discuss its latest options, which are targeted at sophisticated communications users who want to link the power of multiuser Cobol and local data bases on branch minicomputers into host computers via concurrent transaction-oriented communications.

The system will run on a number of different manufacturers' systems including Data General Corp.'s Micronova, nova and Eclipse lines as well as Lear Siegler, Inc. Ampex Corp.'s, Digital Computer Controls, Inc., Keronix, Digidyne and Bytronix machines, the company said. The new product also supports the miniperipherals manufactured by more than 50 different companies.

Communications protocols include interbranch (Blis to Blis), IBM Bisynchronous, point-to-point, Burroughs TC500, IBM 2780, 3780 and 3270 with options such as switched or multipoint (with Blis/Cobol either being polled or doing the polling) Ascii or Eddic data and transparent or nontransparent modes.

Blis/Cobol also supports half-duplex lines with modem control or full-duplex lines with or without modem control at speeds from 110- to 9,600 bit/sec. The lines can be dedicated or dial-up, with or without auto-answer.

Up to three simultaneous communications lines may be

operational using the same or different line disciplines concurrently with other multiuser Cobol program activity, the company said.

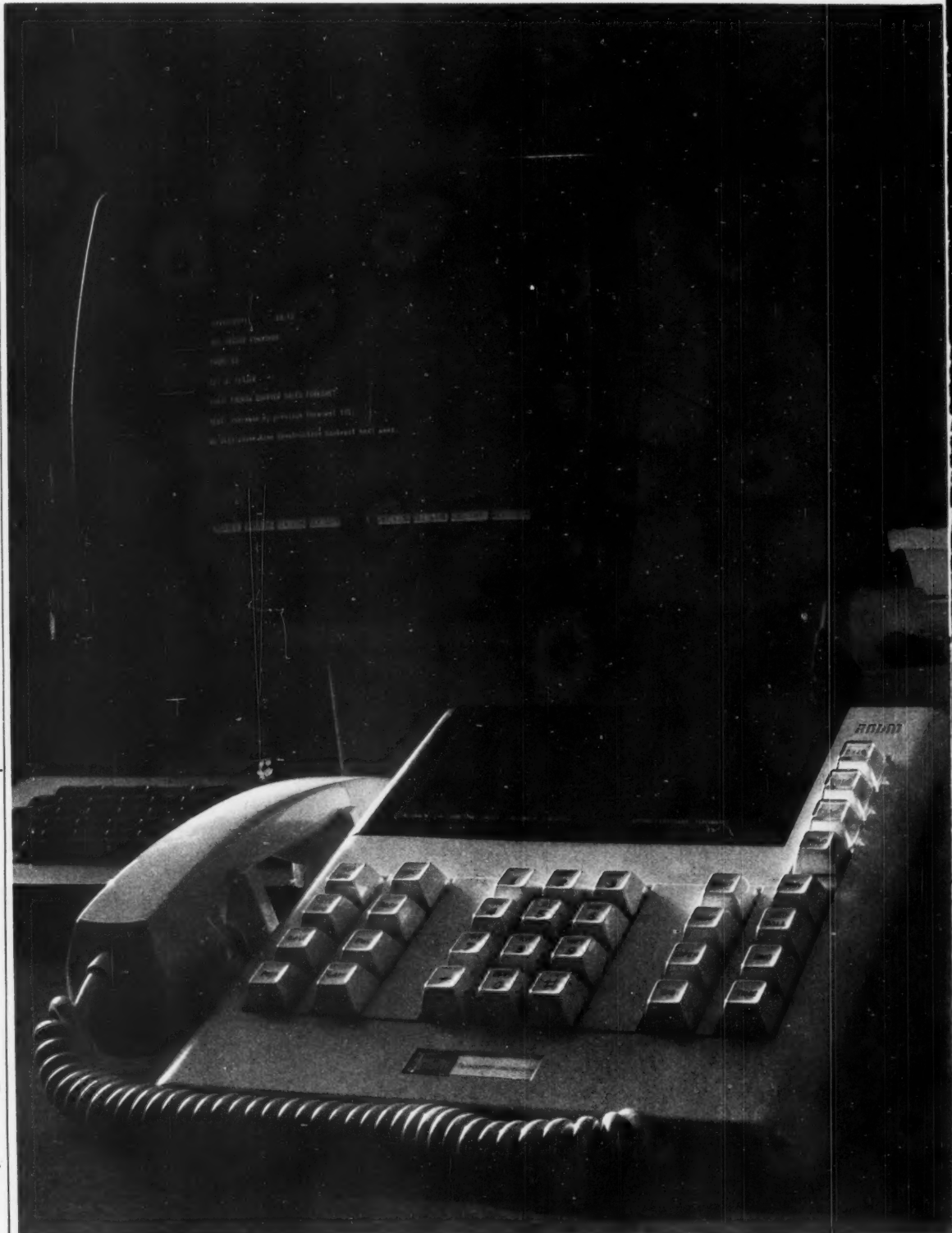
In addition to communica-

tions, the new Blis/Cobol offers an editor, support for hardware multiply and divide and a utility for transferring files between branches over communication lines.

As for price, OEMs may upgrade old systems to the new version for a generation fee. The communications options are priced at \$1,000 per system for interbranch links.

For branch-to-host links, the price is \$2,000 per system.

The product is available from the firm's main office at 1850 Lee Road, Winter Park, Fla. 32789.



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617-679-1051

Software at NCC

Micro Focus Ltd.

NEW YORK — Micro Focus Ltd. will unveil two new versions of its Compact Interactive Standard (CIS) Cobol compiler for microcomputers in Booth 323.

Version 3 enables programs to be written in a subset of Ansi Cobol with the CIS extension and is available to OEMs and to end users for use on the CP/M operating

system.

Version 3 compiles programs at a typical speed of 200 program lines/min on a Z80 system. The compiler is supplied on floppy diskettes (standard

and mini) and will run on any micro that supports the CP/M operating system and has 32K or more bytes of random-access memory, the British software house said.

Resident on the Version 3 disk are two utilities called Config and Forms. The Config program allows the user to modify the compiler to accommodate nonstandard CRTs. The Forms utility eliminates the chore of writing data input and output descriptions by generating a file of CIS Cobol record descriptions that can later be copied into a program, the company said.

Version 4 is designed to support interactive applications in which complete CRT screens are mapped into Cobol record descriptions. Version 4 is intended for use on microcomputers with 48K or 64K bytes. Version 4 meets Ansi Level 1 requirements for a Cobol compiler, the company said.

Micro Focus can be reached at 58 Acacia Road, St. John's Wood, London NW8 6AG, England.

The ROLM Idea: A telephone system that lets you communicate in writing.



Here, for the first time, is an integrated office communications system. Voice and data are combined in a single communication system, the ROLM CBX computerized business telephone system. It's a new way to communicate within your company.

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telephone system. It can be easily upgraded when new software comes along, can test itself and allows the service organization to perform remote diagnostics. Changes to the CBX are made by operating system commands.

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Plug almost any printer or CRT terminal with RS232C ASCII output into a ROLM ETS* 100 executive telephone and simply turn on the terminal to check your electronic mailbox for messages. No modems or special wiring are required. Messages travel to and from the CBX's digital computer over your existing telephone system lines. And sending a message is easy, too: compose, edit and send it over the same system. For a hard copy just add a printer and type "PRINT".

The ROLM Electronic Message System saves time. No more unanswered or uncompleted calls. No interruptions or callbacks. No memos lost in the office mail. Fewer tedious staff meetings.

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There's an optional new high speed 64-bit floating point processor that works in conjunction with a new globally optimized ANS '77 FORTRAN.

No wonder our three most important customers think so highly of it.

OUR OEM CUSTOMERS KNOW WE DESIGNED IT JUST FOR THEM.

The Miniframe is customer microprogrammable. So an OEM can implement his own firmware packages. And with the many software packages we offer, the OEM can add all the bells and whistles he wants.

The Miniframe comes with our largest instruction set ever. So OEM's with their own software have much more flexibility in design.

The Miniframe speaks PASCAL, the powerful new language for scientific, commercial, and system programming that most competitive systems still can't speak. And of course, it also speaks COBOL, FORTRAN and RPG II.

More good news is that the Miniframe is compatible with the rest of the V77 product line.

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System houses also think PASCAL is important. Because it's more efficient, easier to maintain, expand, and modify.

The Miniframe brings systems builders a new query language called QL-77. It features inquire and report facilities. And interfaces directly to TOTAL®, the data base management system. So preprocessing and intermediate handling are a thing of the past. Finally, TOTAL also gives you complete data base access and file access security.

OUR END USER CUSTOMERS KNOW WE DESIGNED IT JUST FOR THEM.

Take all the features we designed in for OEM's and systems houses and say ditto for the end user. But we didn't stop there. We also pressed a few special hot buttons just for end users.

Consider QL-77, for example. End users will love our new query language because it reduces the

TOTAL is a registered trademark of Cincom, Inc.

amount of application programming. By storing query language procedures right in the data base file. Where they can be easily and quickly recalled and executed at any time.

Once again, SUMMIT, our new operating system, helps the end user handle transaction processing. Without any additional, expensive software. It's also the right answer for a multi-tasking, "fully implemented" distributed processing system.

Finally, the Miniframe supports DCA and conventional protocols. So you can talk to both SPERRY UNIVAC and IBM hosts.

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In Europe, write Headquarters, Mini-Computer Operations, London NW10 8LS, England.

In Canada, write Headquarters, Mini-Computer Operations, 55 City Centre Drive, Mississauga, Ontario, L5B 1M4.

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See us in June at NCC, Booth No. 2408

Communications at NCC

Spectron Corp.

NEW YORK — The D-901 Datascope, a member of Spectron Corp.'s family of monitors and data analyzers, and Rasp, a remote access switching and patching system, both newly introduced by Spectron, will be shown in Booths 1016, 1018 and 1020.

The D-901 Datascope combines the capability of a programmable interactive data analyzer and emulator with two large-capacity data storage and retrieval devices to provide the tools necessary to troubleshoot complex network problems, the company claimed.

Incoming data can be monitored and analyzed at speeds up to 1.6M bit/sec

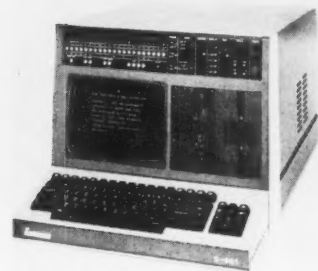
and transfer all interface leads to the remote site for testing. It also allows patch or rearrange connections between network components from a remote site to be made.

It can also activate fallback switching from a remote site and automatically report user-specified alarm conditions to a system console. It has the capabilities to control access, patch and switch functions locally as well as from the remote site, Spectron said.

The primary components of Rasp are patch units, test stations, system console and control units, with the test stations connected to the patch units via test buses.

A system console monitors the operation of the overall system and dynamically reports the system configuration and alarm conditions.

Spectron Corp. is at 344 New Albany Road, P.O. Box 620, Moorestown, N.J. 08057.



The D-901 Datascope

and, along with selected control signals, stored at speeds up to 72K bit/sec. Data storage can be under manual or program control.

Data patterns can be recognized and stored, select messages can be sent in response to a specific incoming sequence, the data stream can be displayed and frozen on a large, 9-in. CRT and confidence and diagnostic tests can be performed, Spectron said.

The D-901 includes two integral floppy diskette drives. The Data Diskette records data and the status of up to eight control signals and the System Diskette stores user programs, system configuration parameters and the operating system.

A 4K-character log buffer and a 4K-character output buffer are standard.

Using a compiler-level language designed for data communications applications, the D-901 can program a wide variety of diagnostic tests and emulation routines ranging from a simple response time calculation to a complex simulation of a front-end processor, the firm said. Program entry is via the alphanumeric keyboard.

The D-901 can operate a slave or master station. A master D-901 can control a remotely located slave D-901; the two units are connected by a dial-up line or leased line.

Initial delivery of the D-901 is scheduled for the fourth quarter. The price will be \$24,800.

Spectron's Rasp provides all the necessary functions to completely control and manage a data communications network of any size or complexity from a single site, away from the main computer room, the firm said.

This enables a user to access an analog or digital interface from a remote

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Communications at NCC

Paradyne Corp.

NEW YORK — A data communications system that allows users to build full-duplex Synchronous Data Link Control (SDLC) networks without Vtam/NCP teleprocessing software or 370X front-end controllers will be shown by Paradyne Corp. in Booth 343c.

Called the PIX II virtual data link, the system includes a local control unit that can attach to the byte multiplexer channel of IBM 360, 370 or Series 30 mainframes, the firm said. The system also contains one or more remote control units to attach peripheral devices.

A self-contained communications system, PIX II is said to provide a virtual data path between a host mainframe and remote locations to enable peripheral devices at those sites to operate as if locally attached to the host.

Also on display will be Paradyne's Analysis network monitoring system that is designed to check operating conditions on communications lines, modems and terminal devices. Analysis also can restore networks from a central site, according to the firm.

By automating circuit failure identification, fault isolation and network restoration, the Analysis system can cut the time required to perform these

three management functions from days to hours or minutes, Paradyne claimed.

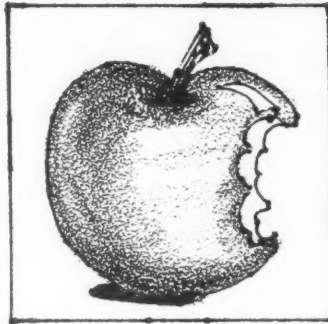
At the core of Analysis is monitoring the diagnostic microcomputer intelligence that is distributed throughout multipoint networks and built into each modem.

The diagnostic microcomputers are loaded at each drop with acceptable parameters for conditions such as line loss, noise and phase jitter. They are monitored continuously during network operation by a central site microcomputer.

Information on terminal, modem and line operating conditions is transmitted from each drop to central site over a low-speed, noninterfering channel. Whenever a problem condition occurs, information on location and cause is displayed in English on the central site's CRT.

Paradyne's exhibit will also include two 9,600 bit/sec modems, the M-96 and LSI-96; two 4,800 bit/sec modems, the LSI 48 and MPU-based MP-48 used with Analysis; and the LSI 24, a 2,400 bit/sec modem that also is used with the Analysis system.

Paradyne is based at 8550 Ulmerton Road, Largo, Fla. 33541.



Racal-Vadic, Inc.

NEW YORK — An originate-only 1,200 bit/sec full duplex acoustic coupler that converts a telephone handset into an acoustic connection for a full-duplex data terminal will be spotlighted in Booths 1000 and 1002 by Racal-Vadic, Inc.

The VA3434 was designed to be used with 1,200 bit/sec data terminals utilizing the Bell 103-type modem protocol. The unit's acoustic cups have a double-flange seal for noise isolation and a handset-to-microphone coupling arrangement that minimizes vibration problems, a spokesman claimed.

The coupler uses advanced digital technology, including CMOS devices and a crystal-controlled oscillator.

The coupler is priced at \$895 from Racal-Vadic at 222 Caspian Drive, Sunnyvale, Calif. 94086.

Canstar Communications

NEW YORK — Canstar Communications will be exhibiting fiber-optic data links for interprocessor and terminal-to-computer connections at rates up to 6M bit/sec in Booths 4116 and 4118.

The Model CEO-56 fiber-optic digital modem is an RS-232C-compatible, full-duplex synchronous unit designed to use Constar cables with link losses up to 35 db. The optical transmission system eliminates all hazards and problems associated with electrical connections and electromagnetic interference, Canstar claimed.

The modem will operate to specifications over distances to five kilometers, using a high radiance LED optical source and an operating wavelength of 820 nmeters.

The TTL-compatible Model CEO-M-06M is used for serial transmissions in simplex or duplex mode and will operate to specifications at distances up to 1.5 kilometers, Canstar claimed.

The company will also demonstrate a range of directional fiber-optic couplers in operating links using the company's fiber-optic Data-cable. The company is located at 1240 Ellesmere Road, Scarborough, Ont. M1P 2X4, Canada.

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programming
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"Of the methodologies discussed in this report, probably ASDM comes closest to meeting this goal."

EDP ANALYZER
(Feb. 79, Vol. 17, No. 2)
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Cutler-Hammer

NEW YORK — Cutler-Hammer will show its Directrol multiplexer control communications system in Booth 416.

The system is said to permit transmission of all wire control system signals (as many as 4,096) in an industrial plant over a single twinax conduc-

tor pair.

Featuring a communications station and terminal stations, the system serves as an independent stand-alone requiring no CPU, but it can also function with virtually any make of computer system, Cutler-Hammer maintained. When a processor is connected, the stand-alone capability reportedly relieves the control processor of many routine tasks and assignments.

Codex Corp.

NEW YORK — The 6000 series of Intelligent Network Processors will be featured at Codex Corp.'s exhibit in Booths 2108, 2110 and 2112.

Included will be the 6010, the firm's most recent addition to the 6000 family.

Another new product at the show will be the LSI 24/24 modem that is said to operate at 2,400 bit/sec in a full-duplex mode on two-wire dial-up or dedicated lines.

The LSI 24/24 will join Codex's line of low-medium- and high-speed modems as well as its international modems, including the 96/V.29 and 481.

In addition, the firm will show its Automatic Circuit Quality Monitoring System (ACQM), Multipoint Network Control System (MNCS) and the Model 900 time division multiplexer, plus line, port and modem sharing units.

Codex is located at 20 Cabot Blvd., Mansfield, Mass. 02048.



Directrol Multiplexer

Features include adaptability to changing applications requirements, plug-in I/O modules, high-speed signal scan monitoring and high security data handling, the vendor claimed.

The firm is at 4201 N. 27th St., Milwaukee, Wis. 53216.

Communications at NCC

Telenet Communications Corp.

NEW YORK — Intelligent data communications processors that feature multi-microprocessor technology and statistical multiplexing capabilities will be the stars of Telenet Communications Corp.'s presentation at Booths 504 and 505.

One of the processors, the TP 1000, is a host/terminal interface concentrator designed for the user who needs to support only a few asynchronous terminals simultaneously with the same error control that is available to large network users.

The unit is plug-compatible with Bell 103 or 113 series modems and requires no software changes in the host computer, communications controller or terminal devices, a spokesman said.

Potential system malfunctions that might affect network service can be detected through the TP 1000's early warning feedback monitor. Remote diagnostics permit rapid fault isolation to a particular port, which can then be taken out of operation without influencing the activities of the remaining ports, the spokesman claimed.

The TP 2200 host interface processor is plug-compatible with Bell 103, 113, 202 or 212 series modems and features an "Autobaud" option that allows a single unit to have an aggregate capacity of 36 line processing units.

In addition, a flow control feature enables asynchronous ports to operate at speeds up to 1,200 bit/sec while remote terminals operate at any speed from 75- to 1,200 bit/sec.

Access to the Telenet central office is provided over synchronous 2,400- to 56,000 bit/sec. full-duplex circuitry using the CCITT X.25 packet-switching protocol, the spokesman continued. The TP 2200 also incorporates statistical multiplexing and early warning feedback functions.

Finally, Telenet's TP 4000 host/terminal interface processor and packet switch was designed to interface computers and terminals to the firm's packet network or other X.25-compatible networks. However, two added capabilities — protocol conversion and packet switching — reportedly make it suited for private as well as public data network use.

The 4000 supports a variety of asynchronous and synchronous protocols and allows 36 line processing units for each single unit, with either four or eight communications ports, the

spokesman stated.

Asynchronous support for the processor is provided at speeds from 75- to 1,200 bit/sec using Ascii, EBCD or Correspondence codes. Local padding, echoing and other terminal support functions are provided under control of terminal commands or request from a remote host computer.

The TP 4000 was designed to be com-

patible with most commonly used synchronous terminals at speeds up to 9,600 bit/sec, as well as newer terminals using advanced bit-oriented protocols, the spokesman continued.

The TP 4000 can operate for extended periods in unattended environments and can be configured with a packet-switching option to provide the capabilities to build distributed net-

works. The packet switching is similar to that used in the firm's public packet network and features end-to-end error control, alternate routing, X.25 packet network compatibility, statistical data collection and accounting.

Additional information on Telenet products is available at the booth or from 8330 Old Courthouse Road, Vienna, Va. 22180.

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Communications at NCC

Digi-Log Systems, Inc.

NEW YORK — Four communications-related products will be put through their paces by Digi-Log Systems, Inc., in Booth 2141.

A programmable network fault storage unit is a 1M-byte device and is a companion to the firm's data line monitor, the DLM II. Called Tapetrap, the unit provides programmable, unattended monitoring techniques for fault isolation on communications lines.

It is operator-selectable to record one track (250K characters) and to stop or record continuously. This last mode provides a record of the last million characters monitored.

A trap sequence of up to 16 characters can be entered into the system, and the user-programmed sequence is used to start or stop recording upon detection. In either case, flags are recorded on the tape at the point where

the match took place.

The flags can be located and the significant data displayed at slow speed or frozen for detailed analysis.

When interfaced to the DLM II, the unit allows users to view their complete data stream — both data and control characters — on a CRT screen, the firm said.

The Tapetrap is priced at \$3,450 and the companion DLM II costs \$2,995.

The DLM II itself will be shown. It enables users to display the data and control characters of a data stream on a CRT. The unit comes in a 21-lb portable package.

The third product on display by the firm will be a portable CRT unit that includes a 5-in. CRT, 300 bit/sec acoustic coupler, teletypewriter-styled keyboard and the Telecomputer display and communications control unit. Priced at \$1,995, the unit is Teletype-compatible and operates in half- or full-duplex mode with asynchronous Ascii discipline. Data rates of 50- to 9,600 bit/sec are switch-selectable.

Printer output for either current-loop or RS-232 interfaces is also provided, the firm said, adding that the character size is also selectable for either normal size — 80 char./line — or double-width — 40 char./line — characters.

The display holds 16 lines, providing for either 1,280 or 640 characters on the screen.

The final product that will be put through its paces is a multiple monitor CRT system. Up to 10 CRT monitors of any size from 5- to 23 in. can be connected to the Telecomputer.

The control unit has an alphanumeric keyboard that can be connected to the data source by RS-232 interface, current-loop interface, modem or built-in 300 bit/sec acoustic coupler. The unit is priced at \$1,570.

Digi-Log Systems resides at Babylon Road, Horsham, Pa. 19044.

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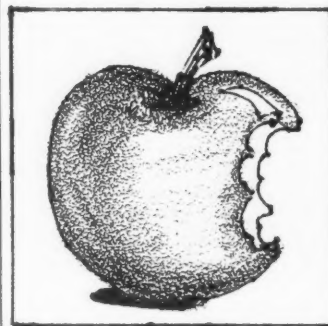
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Anderson Jacobson, Inc.

NEW YORK — Anderson Jacobson, Inc. will display five communications devices in Booths 318 and 319.

• The AJ 1255 modem features full-duplex, 1,200 bit/sec operation and originate/auto answer modes. The unit is suited for interactive time-sharing, message network operation and distributed processing. It is priced at \$325.

• The AJ 1234 is a 1,200 bit/sec full-duplex acoustic coupler/modem that is compatible only with Vadic Corp.'s VA 3400 modem series. The AJ 1234 includes such features as synchronous or asynchronous operation; switch-selectable speeds up to 1,200 bit/sec; automatic digital loopback; RS-232 terminal interface; and zero line turn around time. The unit sells for \$895.

• The AJ 234 is compatible with any low-speed terminal using TTL inter-



The AJ 1234

face. The coupler offers full-duplex Bell 103/113-compatible operation at speeds up to 450 bit/sec. The unit costs \$265, but quantity discounts are available.

• The AJ 510 is the company's newest CRT, featuring a 15 in. monitor displaying 24 lines of 80 columns each. Characters are formed by a 7 by 10 dot matrix in a 9 by 12 character cell. Two character sets are standard: the full 128-character Ascii and a 40-character graphics set. The terminal can also be equipped with an optional APL character set and keyboard.

• The AJ 460 microdiskette system uses 5.25-in. minifloppy disks and offers more than 204K bytes of nonvolatile storage on reusable media, the company said. This is a plug-compatible unit intended for use between existing Ascii printers or CRT terminals and their RS-232 modems. The price is \$1,995; quantity discounts are available.

Anderson Jacobson is located at 521 Charcot Ave., San Jose, Calif. 95131.



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Digitech Data Industries, Inc.

NEW YORK — The Pacer, a portable line monitor and programmable, interactive simulator, will head the lineup of data communications test equipment to be shown by Digitech Data Industries, Inc. in booth 307.

Priced at \$8,500, the Pacer is available for delivery in 30 days.

Other products on display will include a full line of distortion analyzers, pattern generators and various error rate testers, the company said from 66 Grove St., Ridgefield, Conn. 06877.

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Communications at NCC

T-Bar, Inc.

NEW YORK — T-Bar, Inc.'s microcomputer-based Communications Intelligent Matrix Control (CIMC) will be introduced in Booths 3609, 3611 and 3613.

By keyboard-entered commands or preprogrammed software, the CIMC allows the user to switch connections between data lines, modems, multiplexers, concentrators and front-end processors at any place in a distributed data communications system.

Such a reconfiguration is necessary to accommodate changes in traffic volume or modes of communications between points or to restore failed service in parts of a system, the company said.

System reconfiguration will have to be performed at least semiautomatically as systems grow in complexity, a spokesman noted, and the unit was designed to help a human operator cope with rapidly changing conditions.

The CIMC is said to add to the capability of T-Bar's Model 3917 Intelligent Matrix Control (IMC), which rearranges the connections between a computer and its peripherals.

The company will demonstrate some of CIMC's capabilities by controlling a simulated system installed in the company's home town of Wilton, Conn. Personnel will be able to reconfigure the communications and DP system and display the results of the reconfiguration at the booth.

Two displays are offered as accessories to the CIMC. One shows the interconnections in the system as they exist, or as they change when a command instructs switching to occur. The second display depicts by block diagrams what services are at each point in the system and to which lines these services are connected, T-Bar said.

The CIMC is directed via communications lines to control remote standard T-Bar switches to which T-Bar tele-

control conversion devices have been added. These devices can be added to T-bar switches already in the field.

The computer-controlled CIMC can be manually over-

ridden, and a printer can be added to produce a continuous record of changed interconnections or of immediate status, T-Bar said.

The cost of adapting a data

communications system with existing T-Bar switches to the CIMC may vary from \$50,000 to a few hundred thousand dollars.

T-bar, located at 141 Dan-

bury Road, Wilton, Conn. 06097, will also demonstrate its recently announced TD-12 data link tester, the Explorer and Patch +2 data communications equipment.

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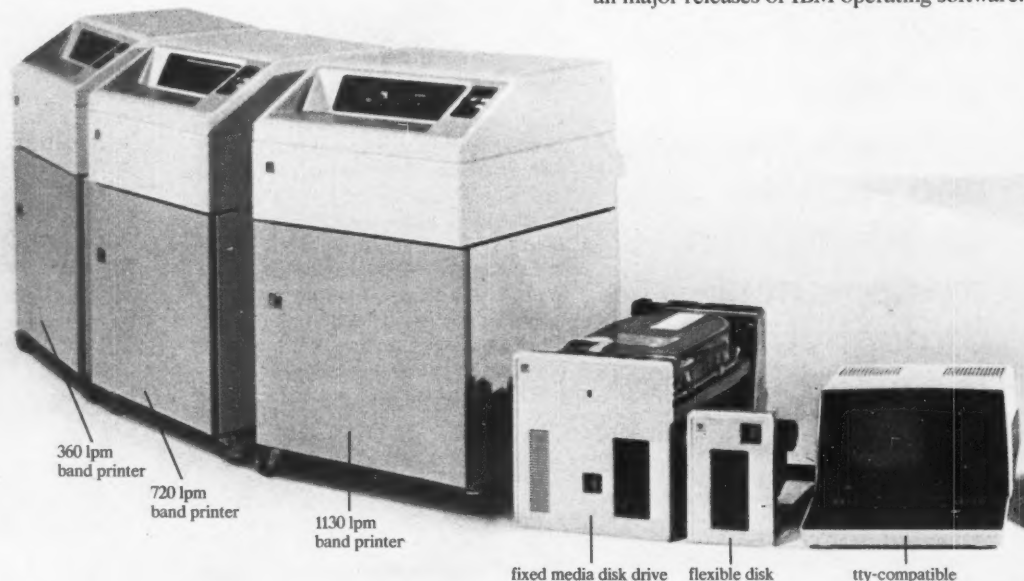
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Communications at NCC

Digital Communications Corp.

NEW YORK — Digital Communications Corp. (DCC) will display its microprocessor-controlled communications processor, the Model CM 9100, in Booths 500 and 501.

The CM 9100 is a software-programmable processor that concentrates four to 32 synchronous and asynchronous data streams into one high-speed link using statistical

multiplexing, the company said.

A second high-speed link is available for increased reliability.

By assigning bandwidth dy-

namically on a statistical basis, the CM 9100 achieves more than double the throughput of conventional time division multiplexers, the company claimed.

The basic CM 9100 includes four synchronous/asynchronous ports and one high-speed Synchronous Data Link Control/High-Level Data Link Control line, 16K bytes of random-access memory for buffers, 12K bytes for application software, microprocessor, power supply and chassis.

In small quantities, the price for the above configuration is \$1,900. DCC is located at 19 Firstfield Road, Gaithersburg, Md. 20760.

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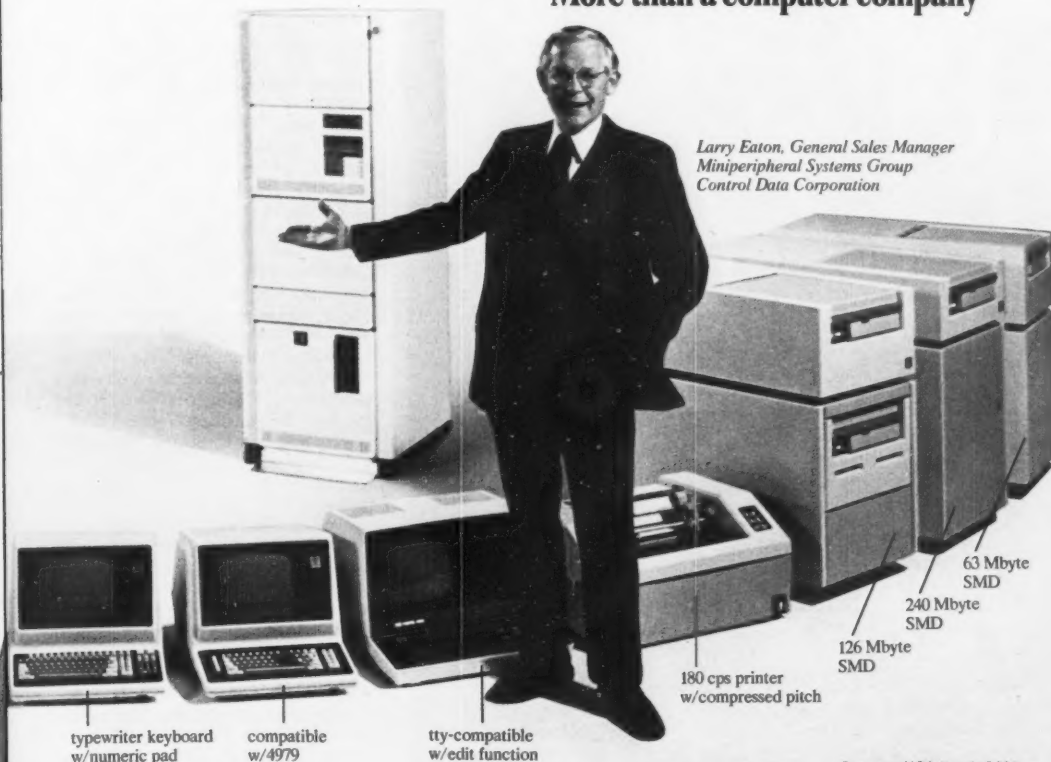
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General Datacomm Industries

NEW YORK — General Datacomm Industries, Inc. will introduce a fast poll modem and exhibit its entire line of data communications equipment here in Booths 4912, 4914, 4916 and 4918.

The Bell-compatible modem, called the 208-9A, can be used in a network with either fast poll or normal speed modems. It runs at 4,800 bit/sec, according to the company.

The 208-9A boasts a feature that allows it to automatically recognize the speed of the modem being polled and adjust the data rate accordingly, the company claimed.

General DataComm will also show its Netcon-5 network diagnostic and control system. General Datacomm Industries can be reached at One Kennedy Ave., Danbury, Conn. 06810.

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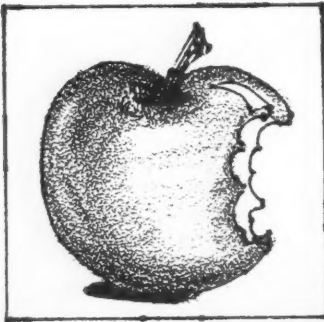
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Communications at NCC

Atlantic Research Corp.



NEW YORK — The Teleproducts Division of Atlantic Research Corp. (ARC) will show its line of products designed for monitoring and troubleshooting data communications networks in Booth 1129.

The Intershake test system will be on display. Intershake is a portable, interactive diagnostic tester for locating problems caused by hardware, software or line troubles.

For the show, the company will in-

roduce its Model J, a programmable data communications monitor and interactive tester.

Like other Intershake systems, the Model J simulates error conditions to locate hard-to-find problems that can degrade network performance. The programmable feature allows a tester to emulate a modem front end, terminals or even a cluster of terminals, ARC said.

Operating at speeds up to 256K

byte/sec, the Model J features expanded functions to ease programming, automatic test capability, an editor for program development, statistical network performance analysis and rapid program entry from keyboard, a spokesman claimed.

It allows testing of Ipar, X.25, Systems Network Architecture packet and IBM 3270 terminals, ARC said.

An interface converter series will be shown for the first time. The IFA series units convert the RS-232C/V.24 electrical interface to either CCITT recommendation RS-440 (V.36), X.21, Bell 303 or V.35.

All converters are interchangeable, and different converters can be installed in the same rack. There is a provision for a TTL interface via a connector for both input and output signals, and they operate on either 115V or 220V 50/60 Hz, the company said.

Also introduced will be ARC's Network Control System — NCS-100 — a family of central site tech control facilities that use ARC-developed modules for patching, switching and testing. NCS identifies and corrects data transmission malfunctions and enables fingertip control of nearly any size network, the spokesman asserted.

ARC's address is 5390 Cherokee Ave., Alexandria, Va. 22314.

We've kept our newest products under wraps. The wraps come off June 4 at the NCC, Booth 4900.

TELEX.

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Tymnet, Inc.

NEW YORK — Tymnet, Inc. will show ACT, a communications computer and communications software combination, here at Booths 376, 377 and 378.

ACT was developed to enable the Tymnet packet network to interface to the multiplicity of protocols that are currently flooding the communications community, including a number of incompatible versions of X.25 and X.75, as well as polled protocols, High-Level Data Link Control, Synchronous Data Link Control and bisynchronous.

ACT stands for Advanced Communications Technology and joins a communications computer (the Tymnet Engine) and modular communications software called the Internally Switched Interface System (Isis), Tymnet said.

According to the company, older versions of Isis are now installed in five countries, providing interfaces to Datapac X.25, Transpac, Venus X.75 and the British Post Office X.25.

The Tymnet Engine is a 1M-byte computer designed for packet communications. Its 256 32-bit general registers in six sets of 16 registers remove the delay caused by register storage during the handling of large numbers of interrupts encountered in a communications environment, Tymnet said.

Engines are now being added to the 400 computer nodes of the Tymnet network, accessible by local call from 165 domestic locations and 85 international locations in 22 countries.

Tymnet can be contacted at 20665 Valley Green Drive, Cupertino, Calif. 95014.

Terminals at NCC

Princeton Electronic Products, Inc.

NEW YORK — Princeton Electronic Products, Inc. will display its 8500M intelligent computer graphics terminal in Booths 2012, 2014 and 2016.

The microprocessor-based terminal features a high-resolution 4K by 3K viewable window in an 8K by 8K addressable field; a 16X panoramic zoom and preview window for selective magnification; stroke-written alphanumerics, symbols, conics and vectors; expandable ran-

dom-access memory; and 32 levels of gray scale. The 8500M costs \$18,900.

Another product on display will be the PEP-500 solid-state image memory/scan converter for visual display of electronic signals from any source. The PEP-500 has an image storage memory that accepts, stores and outputs images in either X-Y-Z or TV raster format.

The PEP-500 includes the TX-1000 Lithocon beam addressed

memory, an internal raster generator, zoom, gray-scale expansion, mode indicator lights, logic for control of read, write, clear and selective erase functions and a choice of either a 525-crystal controlled line rate sync generator, a sync separator or an external sync adaptor. The base price of the PEP-500S is \$4,500.

Princeton Electronic Products can be reached at P.O. Box 101, North Brunswick, N.J. 08902.



Megatek Corp.

NEW YORK — Booths 3319, 3321, 3323, 3325 and 3327 will be the sites for a display of the Whizzard line of refresh graphic terminals and systems that are available from Megatek Corp.

The Whizzards 5000 and 7000 allow the OEM to design around a standard



Megatek Graphics Terminal

shopping list of modular hardware, Megatek said. The OEM can purchase just a vector generator and a graphics processor, a complete graphics terminal or an entire system for stand-alone graphics processing, the NCC exhibitor added.

With the firm's adaptive timing process for vector control, the Whizzard 7000 features a dual bus architecture with a 32-bit tristate graphics bus and a proprietary 32-bit bipolar microprocessor.

The unit has three-dimensional rotation and an optional color monitor. The dynamic system allows both two- and three-dimensional displays at the same time on the same display.

The Whizzard 5000 was designed particularly for Data General Corp. Nova and Eclipse users. It is available as a stand-alone processor, an RS-232 communicating terminal or a dual-board MG552 processor for installation within Nova or Eclipse systems.

Megatek is at 3931 Sorrento Valley Blvd., San Diego, Calif. 92121.



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Terminals at NCC

Epic Data Sales, Ltd.

NEW YORK — Epic Data Sales, Ltd. will show more than 100 working data collection terminals and assorted peripherals in Booth 3114, 3116, 3118 and 3120. The Epic Data 1640 series of data collection terminals are modular in design. Terminals used in a system may be confi-

gured with any combination of the following options: a badge reader (punched or magnetic); a punched card reader (80 col); a 10-digit numeric display; a 32-char. alphanumeric display; keyboards providing up to 20 or 40 user-definable keys; a bar code reader; five or 10 prompting lights; RS-232C ports to support peripherals; special interfaces for BCD and parallel input and output; simplex clock control and memory options.

The terminals communicate with a system control unit, which in addition to sending output to printers or CRTs and storing data on either tape cassettes or flexible disks, also is capable of on-line communications to a host computer.

A new redundancy of the system will be demonstrated for the first time at the National Computer Conference, which provides for automatic backup of the network control by a second system control unit.

Each of the simplest 1640 series terminals costs \$1,482. In orders of 25, the price is \$1,202. Each multifunction unit with 20 keys, an alphanumeric display, a numeric display, punched badge and card

readers, a bar code reader and five prompting lights costs \$3,075 while orders of 25 cost \$3,005.

The firm also will announce a portable weighing device for in-plant use. The unit, designated the Model 1649-01, accepts analog input from a load cell. It registers the empty weight of the container and displays the net weight.

The 1649-01 can be used in conjunction with a printer or on-line to an Epic Data System or host computer. The unit may be used with a variety of load cells of different

capacities. The price of one 1649-01 interface board is \$501.

A new, compact, programmable data collection terminal for remote locations will be demonstrated at NCC. The unit uses an integral cassette drive to store data at the source. It provides all the options of other Epic Data 1640 series terminals except the second bank of 20 user-defined keys.

The price of one stand-alone terminal is \$3,617.

Epic Data is located at 7280 River Road, Richmond, B.C. V6X 1X5 Canada.

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Applied Digital Data Systems

NEW YORK — Applied Digital Data Systems, Inc. (Addis) is secretive about the two products it plans to introduce in Booth 1322, but is eager to admit it will show its recently announced series of Regent terminals.

The Regent 20, the smallest

member of the family, is a simple display terminal with an EIA and current-loop interface. It has upper-and-lower-case characters and a control code display in a 24-line by 80-char. format. Incremental cursor movements and addressability are standard as is

a unidirectional auxiliary port.

The next member of the family — the Regent 40 — is for conversational applications. It has all the features of the 20, plus visual highlighting features, status line, a numeric pad, function keys and a bidirectional auxiliary port. An insert and delete line feature is standard.

Building on the features of the earlier members of the family, the Regent 60 also has buffered transmission and editing capabilities. It can send a character, a line or a page at a time, the firm said, and it offers bidirectional and serial auxiliary interfaces with independent speed settings.

The Regent 300 is a clustered intelligent terminal with 52K bytes of random-access memory, two diskette drives, up to four display terminals, a printer interface and asynchronous and synchronous (software-selectable) communications interfaces.

A four-terminal configuration sells for \$8,080 in OEM quantities of 25, the firm said. Addis is at 100 Marcus Blvd., Hauppauge, N.Y. 11787.

NEW YORK — A double-density, minidiskette storage option and disk-operating system software for the Model 1206 Miniterm portable computer will be introduced by Computer Devices, Inc. in Booth 1304.

The exhibit also will include two data entry enhancements for the Model 1206, plus a switch-selectable, compressed-print option that allows the portable computer, as well as other Miniterm models, to print up to 132 char. in a standard 80-col format, the firm said.

Data entry enhancements for the Model 1206 include a hand-held keypad that pro-

vides two-way interaction and an alphanumeric bar-code reader option.

The minidiskette storage option is available in single- and double-sided configurations. Up to four double-density drives, with capacities ranging from 180K bytes to 1.44M bytes can be supported. The disk-operating system software provides Model 1206 users with random access to that data.

The random-access, minidiskette storage option complements the removable 68K-byte minicassette storage, standard on the Model 1206.

Computer Devices is at 25 North Ave., Burlington, Mass. 01803.



The Epic 1640 Series Tape Drive

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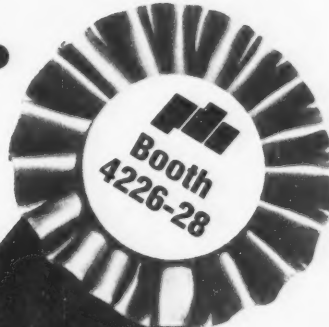
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Model 6111 Automatic Card Reader—The new 600 CPM reader is dust proof, dependable, and ultra-quiet. The advanced designs of the 6111 makes it almost maintenance free.

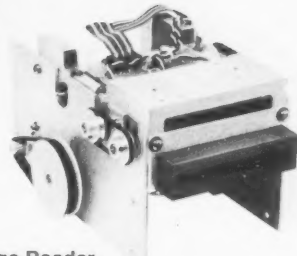


All Weather Badge

The All Weather Badge Reader is at home in hazardous atmospheres and/or demanding environments. Tough and reliable, it meets the requirements of Class 1, Group D, of Underwriters Labs. The All Weather Reader is intrinsically safe and completely weatherproof.



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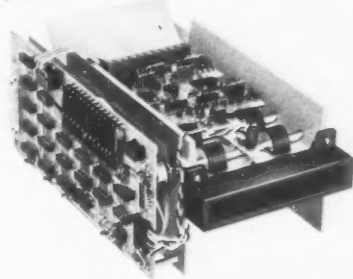


Card/Badge Reader

PDI's Card/Badge Reader can read both standard tab cards and Type 3 plastic badges on an intermixed basis. Unsurpassed in field performance, the Card/Badge Reader has become an integral part of factory data handling application.

Mark Sense Reading

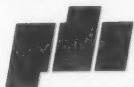
The new Broad Spectrum Read Head can handle almost any mark sense challenge you come up with. It can read felt tip markers, ball point pens, pencils, and any other normally-carried writing instrument.



PDI's first place team will be at the NCC Show, too. Meet (from left to right,)

John Stowe, Ted Lyell, Charles Dobson, Pat Collins, and Tom Hill. They'll be on hand to demonstrate the equipment, answer questions and, more importantly, talk intelligently with you about your specific card, badge, or forms reading needs.

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Terminals at NCC

Informer, Inc.

NEW YORK — The latest in a series of display terminals will be introduced by Informer, Inc. in Booths 2005 and 2007.

Called the D304, the terminal is designed with all control logic under the keyboard to minimize the size of the unit which measures 21- by 8- by

2.5-in.

Priced at \$800 in quantities of 100, the D304 can serially transmit and receive information from an interconnected data source at speeds from 50- to 19.2K bit/sec, the firm said.

The unit has a 96-char. repertoire in Ascii upper- and lower-case. Characters are

generated via a 7 by 9 dot matrix.

The terminal's output signal is a standard 7-bit Ascii plus one parity bit, start bit and one or two stop bits. The keyboard includes a 12-key numeric pad and 14 function keys. Using the shift plus a function key raises the number of output functions to 28, according to the company.

By keyboard or computer,

unit transmits each character including control characters without affecting cursor location, Informer noted.

Data can be received simultaneously with transmission of typed characters. Typically, characters are echoed from the external source to validate operator entries.

In addition to standard features, the D304 comes with 18 option switches to control

ability to broadcast to all terminals by transmitting a hex 20 as a polling address.

The D304 is targeted to both the OEM and end-user markets. Informer is based at 8332 Osage Ave., Los Angeles, Calif. 90045.

Electro Engineering

NEW YORK — Smart editing terminals from Electronic Engineering Co. of California (Eeco) will be on display in Booth 1112.

The Eeco Editor I features a full Ascii, detachable, stepped keyboard with a separate numeric cluster and 16 single programmable keys (32 with shift).

Among its operational functions are cursor wraparound, blinking/nonblinking cursor, screen display mode indicators, all four data transmission segments, request to send header, absolute cursor addressing, 56 other remote operations, local attribute programming and remote diagnostics.

Eeco also offers an Editor II, which includes all the features of the Editor I plus self-diagnostics, paging and 151 other remote operations.

Smart Editing Terminals cost \$1,750 and upwards.

Eeco can be reached at 1441 Chestnut Ave., Santa Ana, Calif. 92701.



Informer D304 Terminal

the D304 can position the cursor on the X and Y axes, insert or delete characters, reverse video, provide dual intensity (foreground/background), set protected or unprotected areas and make characters displayable or nondisplayable.

When used as an interactive terminal set in full duplex, the

such functions as transmission rate, parity, number of characters per line, number of lines, full/half duplex, conversational/block mode, transmit unprotected only/transmit all data and automatic feed on carriage return.

Other options are character insert and delete as well as the

Interface Mechanisms, Inc.

NEW YORK — Two versions of a bar code reading system that allows up to 10 remote scanning wands to operate from a single Model 9200 series bar code reader will be shown in Booths 3202 and 3204 by Interface Mechanisms, Inc.



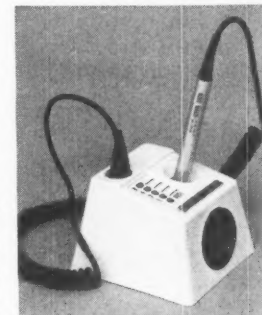
'Our Computer Is on the Blink. Can You Send Over a Hundred of Your Fastest Mathematicians?'

Designed for production control or item-tracking applications, the system operates on a "party-line" basis. When a wand is removed from its receptacle, all other wand stations are disabled and their busy lights go on.

Each wand station is equipped with a speaker that emits a beep for each valid label scan by the light pen. For another station to get on-line with the reader, all wands must be replaced in their respective storage positions.

The stations, which can be bench or wall mounted, use the Intermec Ruby Wand light pen; it is shock resistant and has a durable scanning tip, the firm said.

The Model 9171, with LED status indicators for interaction with a host computer, can be connected in a daisy pattern only. The Model 9170 can



Model 9200

be interconnected in a daisy-chain or star configuration. It is compatible with all Intermec readers, while the 9171 is compatible with all status-indicator readers, the company said.

Interface Mechanisms can be reached at P.O. Box N, Lynnwood, Wash. 98036.

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Terminals at NCC

CPT Corp.

NEW YORK — High-resolution, high-density CRT display modules for graphics and text-processing applications will be demonstrated by CPT Corp. at Booth 362.

The HRD-15 raster display module as it is used with the CPT 8000 word processing system will be demonstrated; extended graphics capabilities have been added for the showing.

The CPT HRD-15 can be used for text processing and graphics. It should be particularly helpful to typesetting data terminal users who re-

quire a readable display of large amounts of data, the firm said.

With a total of 6,200 char. in a 7 by 9 dot matrix, the HRD-15 can display five times as much data as ordinary monitors, the firm claimed. A 15-in. diagonal screen area is provided, and two versions of the HRD-15 are available.

The Model S monitor version incorporates a 50,000 horizontal scan rate with a 60 Hz refresh rate to generate 800 lines of scan. An 800 by 768 dot matrix is available for

graphic display.

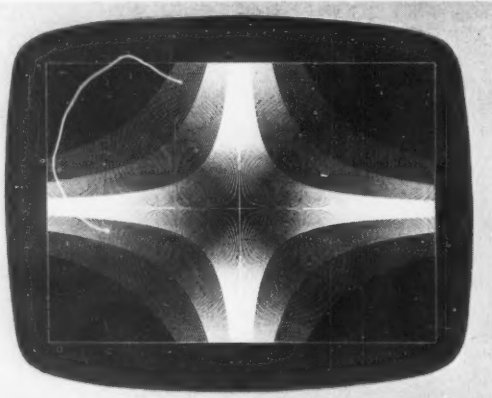
The Model H version incorporates a 64,000 horizontal scan rate with a 60 Hz refresh rate to generate 1,024 lines of scan. A 1,024 by 768 dot matrix is available for graphics displays.

A stand-alone dual diskette system, the CPT 8000 series offers text-editing capabilities for such revision tasks as file

sorting and selecting on multiple alphanumeric keys.

Standard features include a multiple printer capability, computer hyphenation, automatic centering, a filing system for 1,000 alphanumeric page labels and a 10-key pad with decimal alignment.

CPT Corp. is at 1001 Second St. So., Hopkins, Minn. 55343.



HRD-15 Raster Display Module

Termiflex Corp.

NEW YORK — Termiflex Corp. will show an integrated control/display unit that provides control panel functions with operator prompting in Booth 1126.

A solid-state control/display terminal, the Termiflex HT/10 allows simple entry of machine commands and set points, while providing an alphanumeric display of status, operator prompting or other information, the company said.

The unit has a 12-char. display and 20-key pad; it

weighs 11oz and is packaged in a rugged case suitable for factory environments.

The HT/10 provides bit serial asynchronous ASCII communications via RS-232C, 20 mA current loop, TTL or RS-422.

The 96-char. ASCII set can be displayed, and all 128 ASCII char. and control codes can be generated. The unit operates on +5 Vdc.

HT/10s cost \$316 each (in lots of 100). Termiflex is located at 17 Airport Road, Nashua, N.H. 03060.

Magnavox Display Systems

NEW YORK — Magnavox Display Systems will feature its Orion 60/54 CRT terminal in Booths 1615, 1617 and 1619. It is said to combine the display and control features of the plasma-panel-based Orion 60 terminals and the S4 Microcomputer System.

The Orion 60 offers full graphics with floppy disk storage, as well as optional rear-projection functions. It allows the user to create displays and enter data by touching the screen. One can program character sets and generate vectors of any length to

absolute coordinates, the company claimed.

The S4 has system software with development capabilities that are said to be as good or better than those found in many larger computer systems. Features include CP/M 8080 system utility routines such as windows, zoom, subimage movement and rotation, Magnavox said.

At the show, the system will be demonstrated. Magnavox Display Systems can be contacted at 2131 Coliseum Blvd., Fort Wayne, Ind. 46803.

Maine

NEW YORK — The Data-Mate line of terminal furniture will highlight Maine Manufacturing Co.'s exhibit in Booth 3000.

Included are stands for RO and KSR printers, CRT and mobile terminals and a fanfold forms stacker. Printer stands for use with Centronics Data Computer Corp. Series 100, 300, 500 and 700 printers are also part of the line.

Data-Mate products are said to feature paper catcher trays, in and out wire saddle baskets, copy holders and welded-steel construction.

Maine Manufacturing is located at 46 Bridge St., Nashua, N.H. 03061.

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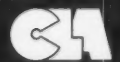
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Terminals at NCC

Dialog Systems, Inc.

NEW YORK — Dialog Systems, Inc. will introduce a voice input terminal for data entry applications in Booths 381 and 382.

The Model 1800 allows users to transmit or receive data directly from a computer by talking to it over the telephone, the company said. The 1800 is "speaker independent," which means that the user does not have to train the system to his voice before calling. It

can accommodate eight users simultaneously.

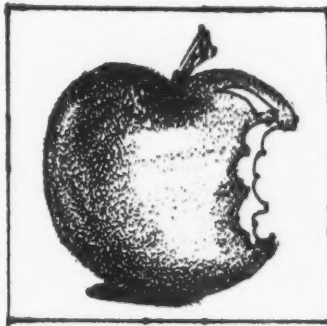
The Dialog terminal has various standard word-recognition vocabularies that differ in size according to the application. For a banking application, the system provides 21 words, including 10 digits and command words such as "balance," "transaction," "cancel" and "total."

Optional recognition words can be added to the system for a charge.

The voice-response vocabulary for banking is bigger than the recognition vocabulary. The banking voice-response vocabulary consists of 128 words, providing up to 64 sec of speech.

The 1800 interface capabilities allow data communication with the standard RS-232, asynchronous full duplex up to 4,800 bit/sec or 20 mA serial current loop (Teletype). The terminal also can emulate standard computer interfaces such as the IBM 3271, the company said.

Dialog Systems is located at 32 Locust St., Belmont, Mass. 02173.



Delta Data Systems Corp.

NEW YORK — Delta Data Systems Corp. will introduce its Delta 2830 stand-alone microprogrammed terminal in Booths 4107 and 4109.

This CRT terminal was designed for multidrop communications networks that use Burroughs Corp. computers and display terminals. The 2830 offers enhanced emulation of Burroughs Models TD831 and TD833 display terminals at a lower cost, the company said.

All features available in the Burroughs terminals are available in the Delta 2830, in addition to many other features standard in the 2830, but optional in the Burroughs terminals.

Among the standard features offered in the Delta terminals are concatenation with auto bypass, teletypewriter mode (in addition to normal Burroughs protocols) an integral numeric keypad, a large display area with extended status line and a 7 by 9 char.

matrix, an optional line monitor mode, printer output and an enhanced data communications buffer operation.

Prices of the Delta 2830 start at \$2,500.

Delta also will show its 7000 family of intelligent terminals at its booths. The 7000 series includes three programmable 16-bit microprocessor terminals. They are the 7300 advanced communications oriented text processing terminal, the 7100 general-purpose editing terminals and the 7500 programmable random-access memory display terminal.

The 7000 series has text memory of up to 28,000 char., a multiple split screen, a large character set capability (128 up to 892 char. and other features, according to the company.

Delta Data Systems Corp. is located at Woodhaven Industrial Park, Cornwell Heights, Pa. 19020.

GE

NEW YORK — General Electric Co.'s Data Communication Products Business Department will be exhibiting the Termet 340 Correspondence Printer (CP) that produces letter-level clarity at speeds up to 340 line/min in Booth 4316, the firm said.

The Termet 340 CP utilizes line printer technology based on the Termet 340 line printer already introduced. Enhanced with a multistrike carbon-film ribbon cartridge that is operator replaceable, the unit uses a continuous carrier that hosts most letterhead stocks.

Other printer features include a servo-controlled paper drive, operator selectable at 6- to 8 line/in. spacing,

and a programmable all-electronic 8-channel vertical format unit. A choice of print styles is available. The printer interface is bit parallel, but serial interface also is offered.

Deliveries are projected for fall of this year at a cost of less than \$6,000.

The Termet 200 matrix printers and the Termet 340 line printer will be displayed. The Termet 9610 communication controllers will be used to drive printers in demonstration modes through a series of programs.

Emulations and remote job entry stations will be demonstrated during the show.

The firm is located in Waynesboro, Va. 22980.

Grundy and Partners Ltd.

NEW YORK — The Data Eez 2000 interactive display terminal from Grundy and Partners Ltd. will be shown for the first time in Booth 4416H.

The unit is comprised of a display panel, an integral main power supply unit, microprocessor control communications and a fiber-optic pen. The equipment uses a matrix of LEDs, each allowed easy identification by implementation of an overlay facility, the firm said.

The method reportedly opens "virtually limitless" application possibilities in all areas of commerce and industry. It is said to be suitable for stock control, shop-floor data collection, order taking and management information.

The microprocessor allows simplification of dialogue with the host computer, enabling groups of LEDs to be set or reset by one instruction.

Grundy and Partners Ltd. is located at Bond's Mill, Stonehouse, Gloucestershire GL10 3RG, England.

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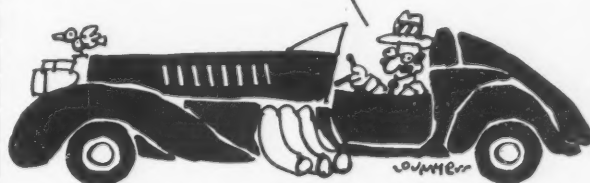
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Systems at NCC

Tektronix, Inc.



NCC '79

National CSS

NEW YORK — National CSS, Inc. (NCSS) will show its 3200 computer system in Booths 514, 515 and 516.

The 3200 series offers five 32-bit virtual memory models that are IBM 360- and 370-compatible, using the NCSS operating system, CPS.

The 3200 can handle all major can handle all major programming languages. The communications-oriented series allows three simultaneous operating modes: on-line interactive, remote job entry and batch.

NCSS is at 187 Danbury Road, Wilton, Conn. 06850.

NEW YORK — Tektronix, Inc. will introduce two desktop graphics computing systems as upward extensions of its 4501 graphics computing system in Booth 4408.

The firm will also be showing its 465B 100 MHz portable oscilloscope.

The 4052 and 4054 desktop systems feature a new Tektronix-designed processor and memory architecture, the firm said. Expanded graphics capabilities have also been added, including a 19-in. display on the 4054, compared with the 11-in. display offered on the 4051 and 4052.

The 19-in. screen offers more than 13 million addressable points, allowing it to support 133 character lines of text. The user can thus preview full pages of computer printout at a glance, the company said.

The three 4050 series products are compatible in language, storage and software. Complete graphics support is standard, and all 4050 series members support demand screen hard copy of graphics and/or alphanumerics.

The company said all existing Plot 50 software can be used, permitting system expandability to multiuser configurations. Plot 50 software packaged programs include the Mathematics

Program Library, General Utility Programs, Business Planning and Analysis, the Statistics Program Library, the Electrical Engineering Program Library and Graph Plot.

The latest software product is the Modeling and Reporting software package, a management-oriented decision-making tool, the firm said.

With a minimum of training, 4050 users can turn mathematical formulae or management problems into detailed high resolution graphics solutions using the Basic language, a spokesman added.

The processor executes instructions that were added to facilitate fast, accurate (14-digit) floating-point arithmetic, the firm said.

The operating system of the units has been enhanced to permit transcendental functions.

The series is compatible with a full line of Tektronix options and peripherals. The 4051 is priced at \$5,995, the 4052 costs \$9,800 and the 4054 costs

\$16,500.

As for the 456B 100 MHz portable oscilloscope, features include flexible vertical mode controls, simultaneous trigger view with zero delay, 2nsec maximum magnified sweep speed,



The Tektronix 4052

low-noise IC technology for sharper trace and LED panel indicators. The price is \$2,495.

Tektronix can be reached through P.O. Box 500, Beaverton, Ore. 97077.

Chromatics, Inc.

NEW YORK — Chromatics, Inc., at Booths 4523, 4525, 4527 and 4529, will unveil a number of products, including peripheral options for its CG series of color graphics computers and a color graphics management system.

Nanodata Corp.

NEW YORK — Nanodata Corp. will exhibit its VMX and QM-1 computer systems in Booths 316 and 317.

Priced at approximately \$185,000 depending on configuration, the VMX line is fully compatible with \$200 billion in existing IBM 370 software, according to the manufacturer.

The VMX multiprocessor is said to provide virtual memory hardware, multiple data buses and direct addressing of 32M bytes of memory.

Nanodata's QM-1 emulates any digital computer or I/O device, the firm said, and currently runs unmodified software from more than 20 systems including those made by IBM, Digital Equipment Corp., Control Data Corp. and Data General Corp.

A typical QM-1 configuration costs \$300,000.

Nanodata is headquartered at 2457 Wehrle Drive, Williamsville, N.Y. 14221.



'And as our New Sales Manager, We'll Expect You to Wear These.'

A hard-copy color interface, introduced at the show, connects the CG series of processors to a Xerox Corp. Model 6500 color graphics printer for direct screen printout on plain copier paper or on a color transparency. The option sells for \$1,500.

Option 82, a light pen, costs \$1,000 and was designed to select menus, identify character coordinates or send coordinate locations on the CRT screen to the CPU section of the color graphics computers.

Basic programs are reportedly enhanced by the use of the firm's Microsoft Z80 Disk Basic, which has 35 keyword program statements, 14 editing and command statements, 27 mathematical functions, 14 string functions, 18 file operations and 19 arithmetic operations. The software sells for \$675.

For high-speed communications, Chromatics will debut a parallel I/O port with direct memory access (DMA) channel that allows the user to send or receive information at speeds of 416K byte/sec for an 8-bit port. Option 33, the parallel I/O port, and Option 34, DMA controller, may be configured for 8-bit operation or for 16-bit operation. The parallel I/O port sells for \$1,000 and the DMA controller for \$750.

Chromatics' color graphics management system reportedly enables users to draw original artwork or trace drawings in less time than it takes to draw them with conventional techniques. Drawings made through the system are duplicated on the CRT screen, and automatic fill routines in the software manage the coloring of large areas.

The base price of the CG1399M management system is \$21,995.

Chromatics is at 3923 Oakcliff Industrial Court, Atlanta, Ga. 80340.

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Peripherals at NCC

Diablo Systems, Inc.

NEW YORK — Diablo Systems, Inc. will feature a number of printers, a small business system with an intelligent terminal and a pair of automated paper-handling devices. These products can be seen at Booth 2201.

Among the printers to be shown are:

- The microprocessor-controlled models 1640 and 1650 terminals in both keyboard send-receive and receive-only versions. The 1640 KSR is a 45 char./sec plastic daisy wheel printer featuring the Diablo-designed universal interface, which incorporates both serial and parallel ports for easy integration with user systems. The price is \$2,280. The receive-only version — the 1640 RO — is available for \$1,975.

- The 1650 KSR, with additional capabilities, costs \$2,355, while the receive-only version costs \$2,050.

- The Hytype II Model WB wide-bed printer with a metallized print wheel and a print line of 26.3 in. Its \$2,235 price tag includes a friction plate and RO cover.

- The Hytype II Model 1355 WP OEM printer mechanism with a metallized print wheel. The price is \$1,215, including friction plate and cover.

- The Hytype II Model 1355 HS high-speed OEM printer, operating at up to 60 char./sec for \$1,185.

- The Model 2300 matrix printer that operates at 200 char./sec bidirectionally. \$1,015 buys the printer and electronics.

Diablo will also show its Diablo 3200 small business system, with prices beginning at \$18,000. The system includes a 488 nsec cycle time, up to 64K bytes of memory in 8K increments and either single- or double-density diskettes having 1M byte or 2.5M bytes of storage, respectively.

The disk system is a model 44B movable cartridge disk of 5M bytes mounted over a fixed disk of 5M bytes.

A CRT with a 12-in. screen, 1,920 characters and a 96-char. Ascii set is included, and there is a choice of the Diablo Hytype II or Diablo matrix

printers.

Paper-handling devices include the Hyfeed cut sheet feeder and the auto front feed, which cost \$775 and \$1,050, respectively.

Diablo will also exhibit at the NCC personal computing festival in Booths 16 and 17, the company said.

Diablo is at 24500 Industrial Blvd., Hayward, Calif. 94545.



Telex

NEW YORK — Telex Computer Products, Inc. will introduce six products at Booths 4900, 4902, 4904, 4906, 4908 and 4910.

- The Series 80 is a down-sized tape subsystem that is IBM 360/370-compatible and whose tape drive encompasses 800-, 1,600- and 6,250 bit/in. the company said. The unit features a

down-sized column frame, a powered tape display window and rear access for servicing. It includes a low-inertia capstan and a Telex tape path for high program rates.

- The TC 277D CRT is IBM 3270-compatible, but 20% more compact, the company claimed. The unit has an optional response-time indicator that measures CPU delays in responding to each terminal transmission. Keyboard enhancements on the TC 277D include an optional 10-key numeric pad and 12 special-function keys; an automatic repeat on all alpha and numeric keys; an upper-case or upper-lower case entry mode switch; and a switch-selectable off-on keyboard clicker.

- A stand-alone CRT, the TC 276 is compatible with the IBM 3276 and 3278 and offers users a built-in controller.

- The TC 278 is a CRT that is also compatible with the IBM 3276 and 3278.

- The Telex TC 950 is a consumer finance terminal. Telex claimed the unit prints three times faster than conventional terminals with consistent print quality through multiple forms. Changing to higher transmission speeds or to a different computer service can be achieved with the flick of a switch, the company said. The TC 950 is compatible with 1980 and 2740 protocols.

- Telex's key-to-disk data entry system comes with 64K words of memory or 128K bytes. Disk capacities of 10M- or 20M bytes are offered, with an option to add up to four cartridge disks to each system, the company said. The unit is compatible with the IBM 2780/3780.

Telex is at 6422 E. 41st St., Tulsa, Okla. 74135.

Facit-Addo, Inc.

NEW YORK — Facit-Addo, Inc. will feature the 4540 Serial Page Printer and the 4030 Tape Reader in Booth 1316.

The 4540 uses a printhead that has hammers instead of needles or wires. Using the force-flex hammer principle, Facit has developed a tight, small head. The company said the 4540 printhead is guaranteed to produce 500 million char. — about five years of normal use — at a fraction of the power consumption of conventional matrix print-heads.

One feature of the 4540 is a device that adjusts the impact force to the number of copies inserted in the printer.

The 4030 low-speed tape reader has a compact mechanism containing only one part, which reads up to 120 char./sec. It is an optical, bidirectional reader for all standard 5-, 6/7- and 8-track tapes with up to 60% transmissivity, according to the company.

Featured with the 4030 will be the 4013 Servo Spooler Unit for up to 330 feet of tape.

Facit-Addo is at 66 Field Point Road, Greenwich, Conn. 06830.

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Peripherals at NCC

Epson America, Inc.

NEW YORK — Epson America, Inc., Booths 3201, 3203, 3205 and 3207, will boast an 80-col. dot matrix printer, a 5 by 7 dot matrix LCD module and a Phase

Transition Mode LCD.

The TP-80 dot matrix printer uses the firm's Model 3110 print mechanism and is reportedly complete with electronics and case. The 5 by 7

dot matrix model includes a driver chip and can display 16 char. on one line and 20 char. on two lines, a spokesman said.

The Phase Transition Mode

LCD is a color LCD with no viewing angle restriction. The device will be shown in both a clock display and a cash-register display application.

Epson will also show many

of its other standard products, a spokesman said from 23844 Hawthorne Blvd., Torrance, Calif. 90505.

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Sanders Technology

NEW YORK — Sanders Technology, Inc. will introduce its Media 12/7 typographic printer in Booth 4922.

The 12/7 prints its strike-on image serially in a bidirectional mode. Multiple typefaces are available in a variety of styles and sizes, all of which can be mixed on the base line, the company said.

One fully formed typeface in 10 or 12 pitch and one high-speed matrix face are included in the standard model, whose OEM price is \$4,000.

Places Dots

The 12/7 can place a 13-mil dot anywhere on a page to within 1-mil accuracy, the company claimed. Vertically, the dots can be placed as close as 3.5 mils apart and horizontally, as close as 8 mils apart, the company said.

The 12/7 is under the control of a built-in Zilog Inc. Z80 microprocessor, which can intermix a variety of typefaces. As many as 11 typefaces can be stored in read-only memory within the printer.

The company also offers scientific, OCR and foreign language sets. The 12/7 can produce signatures in anyone's handwriting, the company added.

Sanders Technology is at Columbia Drive, Amherst, N.H. 03061.



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Peripherals at NCC

Innovative Electronics

NEW YORK — Innovative Electronics, Inc. will show the Innovator 250 Demand Document Printer in Booth 2037.

The printer was designed for multi-form airline ticket printing and applications where the printed form is required immediately after printing, such as banking, insurance, travel agencies, hotel reservations, hospital and invoicing operations.

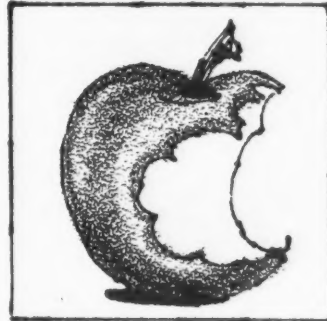
The Innovator 250 offers immediate access to the printed form in addition to providing the legibility of the fully formed character, the vendor claimed.

The tractor feed mechanism is capable of printing 80 char./line on variable width and length multipart forms at 300 line/min.

Centronics Data Computer Corp., Dataproducts, Corp., 20/60ma current-loop and RS-232 compatibility is offered as standard.

Fault isolation is implemented through the use of diagnostics under microprocessor control. Innovator 250 costs \$4,450; quantity discounts are offered.

Innovative Electronics, Inc. is located at 15200 N.W. 60th Ave., Miami Lakes, Fla. 33014.



Rutishauser Data AG

NEW YORK — A cut sheet feeder that inserts and stacks paper automatically into Diablo Systems, Inc. printers and terminals will be among the products shown here in Rutishauser Data AG's Booth 433.

The RS901 can be fitted and removed from a printer like a tractor feed without modification of the printer or terminal. There is no signal transmission between the printer or terminal. The unit is synchronized with the printer platen and works as fast as the printer platen moves.

The unit is controlled by a built-in microprocessor. Errors are indicated by an audible, visible and electrical signal, the Swiss firm said. The cost is \$750 in 100-unit quantities.

The mechanical Front-Feed RF404 allows the program-controlled insertion of cut single forms, cut multipart form sets or ledger cards into the Diablo printer or terminal.

The RF404 is driven by the gear of the printer platen and by program control. The form can be inserted, positioned to any desired position and ejected, Rutishauser claimed. The cost is \$550.

The company plans to show the bi-directional tractor feed for the Qume Corp. printer or terminal, called the RT103. It has two flaps to push and pull the paper and can be fitted onto the printer platen.

Precision Handling Devices, Inc.

NEW YORK — Two paper motion monitors that give notice of a paper jam and are said to minimize loss of data and damage to the printer will be displayed by Precision Handling Devices, Inc. at Booth 4000.

Processor Model PMP ensures that paper responds to a line-advance command from the printer's controller. If a paper jam occurs anywhere in the paper-feed path, or if there is a paper-

out condition, the processor will signal the printer controller to shut down.

The Detector Model PMD responds with a change of signal every .080 in. of linear paper travel. Monitors can be mounted on the right or left tractor and come with 2-ft. color-coded lead wire.

Complete details are available from the company at 63 S. Main St., Assonet, Mass. 02072.

Data Electronics, Inc.

NEW YORK — Data Electronics, Inc. will unveil the 34M-byte Microtape digital cartridge tape drive in Booths 368 and 369.

The data capacity of the unit results from the first application of 7-track technology to the previously 4-track, .25-in. Ansi/Ecma digital cartridge, the company said.

In addition, group code recording is used with a resultant density of 7,200 bit/in. Recording is serpen-

tine, with adjacent tracks being recorded in the opposite direction.

The previously required rewind time that was needed to move from one track to the next is eliminated, the company said.

The drive, in OEM quantities, costs about \$1,500. The unit will be available in the third quarter.

Data Electronics is located at 370 N. Halstead St., Pasadena, Calif. 91107.

Gould, Inc.

NEW YORK — The Instruments Division of Gould, Inc. will present its system for off-line plotting of computer graphics on electrostatic plotters and printer/plotters in booths 3015 and 3021.

The VIP Off-Line Plotmaster consists of a microprogrammed, multiple microprocessor-based vector information processor (VIP) and up to eight Gould 5000 series electrostatic plotters and printer/plotters of the same or mixed types.

VIP input may be vector plot, raster plot or print information, all of which can be stored on the same 9-track multifile tape and plotted or printed under control of the VIP standard IBM

tape formats, labeled and unlabeled, are accepted.

The Plotmaster reduces host computer processing and storage burden, since the host need only generate and sectorize the vectors described by the user's application program, Gould said.

Overlapped Input

Double-buffered memories in the VIP allow overlapped data input, processing and plotter data transfer for maximum hard-copy output speed with Gould electrostatic plotters. The standard double-buffered raster memory of 16K byte/buffer is expandable to 64K byte/buffer for a total of 128K bytes.

Up to eight plotters and print/plotters can be connected via a daisy-chain configuration to one VIP, the company said.

Prices for VIP systems range from \$25,750 to \$36,250 depending on tape drive and memory options. The Instruments Division of Gould is located at 3631 Perkins Ave., Cleveland, Ohio 41114.

GNT Automatic, Inc.

NEW YORK — GNT Automatic, Inc. will roll out its GNT 3601 tape punch station for the first time here in Booth 2004. The unit is reportedly the only machine of its kind on the market based on an Intel Corp. microprocessor.

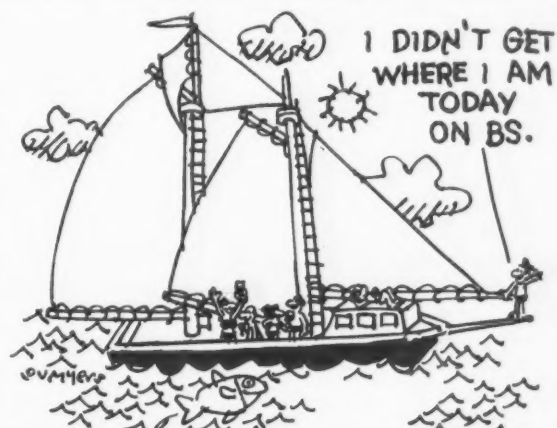
The GNT 3601 was designed to handle all kinds of paper as well as mylar tape, and the die-block is said to have a lifetime in excess of 150 million char. It consists of four major parts, all of which are field replaceable.

Noise levels from the machine, the company claimed, are lower than any punch system available on the market. It punches up to 75 char./sec, utilizing a 36-punch mechanism. Either 5- or 8-channel ISO or six-channel TTS data can be punched, depending on what die-block is installed in the mechanism.

The 3601 is available in two versions, with punching speeds of 50- and 75

char./sec. The tape dispenser handles an 8 in. roll.

The single product price is \$1,495 from GNT Automatic at 1560 Trapelo Road, Waltham, Mass. 02154.



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Peripherals at NCC

Dataroyal, Inc.

NEW YORK — A variety of both parallel and serial interface intelligent printers as well as an intelligent hard-copy terminal will be demonstrated at NCC by Dataroyal, Inc.

Scheduled for introduction at the show is a condensed printer, available in both parallel and serial versions, which can print 16 char./in., instead of the usual 10, in 132-columns across an 8-in. piece of paper.

The condensed printer was designed for applications in which the user has to fit a lot of data into a small amount of space, a spokesman said. Other unveilings at the show will be an incre-

mental printer and a low-cost unit.

The firm will also display a heavy-stock, bottom-feed printer structured to print on tough surfaces such as steel, plastic and cardboard. The IPS-7440 features a 7 by 7 dot matrix and bar code 39 — an alphanumeric bar code used in federal government applications, the spokesman said.

Dataroyal's IPS-7326 intelligent hard-copy terminal is a 150 char./sec unit that incorporates a movable data input station consisting of a gas-discharge display and an Ascii keyboard. It is geared for data logging, factory data collection, label printing

and other jobs requiring both output and computing abilities.

The Booth will include the firm's IPS-7048 and 7049 parallel interface printers and the IPS-7249 serial Teletype-compatible printers. All the printers feature a 9-wire print head, a 7 by 9 dot matrix (instead of a 7 by 7 dot matrix) and print a 96 Ascii character set at 200 char./sec.

Models 7048 and 7248 feature a 500 char. circular buffer, while Models 7049 and 7249 offer a 3,500-char. buffer.

All of Dataroyal's printers have an 8-bit microcomputer supporting ran-

dom-access and programmable read-only memory.

Dataroyal is at 235 Main Dunstable Road., Nashua, N.H. 03060.

Dataram Corp.

NEW YORK — Dataram Corp. will trot out its Bulk Semi memory system for display in Booth 1506.

The 8M-byte system is packaged in 15.75-in. chassis and includes error correction circuitry as one of its standard features. The unit can be used for disk emulation while offering main memory speeds, the firm indicated.

The basic system unit for the devices is Dataram's two-board DR-129S system, consisting of a controller board and an array board. The controller supports up to 16 array boards and has the capability of configuring the available memory in 2-byte or 4-byte words.

The cycle and access times for a 36-bit word are 500 nsec and 350 nsec, respectively, the firm said. A 1M-byte unit is priced at approximately \$17,000, Dataram said, depending on OEM discounts. The firm is located at Princeton-Highstown Road, Cranbury, N.J. 08512.

Kybe Corp.

NEW YORK — Magnetic Media Maintenance Equipment from Kybe Corp. will be on display in Booths 2018 and 2020, along with the company's line of digital and word processing cassettes and flexible disks.

Kybe's SLT-80 automatic loading tape tester is reportedly the only automatically loading cleaner/evaluator for both 1,600- and 6,250 bit/in. densities. The system performs a full tape clean,

test, retention and restack cycle in less than four minutes.

Lockable management controls enable users to test single- or dual-density tapes with a 9-channel format.

The E-24 Mod VI computer tape cleaner can clean a 2,400-ft tape reel in 1.6 minutes and handles a full clean, retention and rewind cycle in 3.2 minutes, the company said. It accommo-

dates 1/2-in. tape on reels up to 10.5 in. and recognizes EOT/BOT reflective markers.

Kybe's instrumentation tape cleaner, the ITC-150, can be used for either 1/2-in., 1-in. or 2-in. width configurations.

It restores precise head-to-tape contact and reduces signal dropouts, according to the manufacturer.

A bulk eraser for tape reels up to 16 in. in diameter, a cassette tape cleaner and associated equipment will also be on display. Kybe is at 132 Calvary St., Waltham, Mass. 02154.

Data Specialties, Inc.

NEW YORK — Data Specialties, Inc. (DSI) will introduce a microprocessor-based high-speed reader-punch in Booth 1528.

The SRP-750 was designed to reduce line and operating costs by working as a high-speed peripheral or stand-alone device, the company said.

Features of this dual-ported serial RS-232 system include a 4K-byte random-access memory (RAM) buffer,

panel selection of up to 3,000 bit/sec send or receive operation, auto diagnostics and full- or half-duplex operation with high-speed edit or duplication capabilities.



Data Specialties Reader Punch

Additional features will include plug-in option boards for code conversions or additional RAM.

The punch of the SRP-750 uses Mylar or paper tape interchangeably, without requiring registration readjustment, the company said.

The unit is guaranteed to punch more than 2 million feet of paper tape or 500,000 feet of Mylar, the firm said. The unit is priced at \$2,695.

DSI is at 3455 Commercial, Northbrook, Ill. 60062.

Peripheral Dynamics, Inc.

NEW YORK — In center ring of the Peripheral Dynamics, Inc. booths — No.s 4226 and 4228 — will be the 2022 series of card readers.

Designed for OEMs, the series has a read speed of 200 card/min. and a hopper capacity of 200 cards. It can read punched cards in 80-column formats or color mark-sense cards in 40- or 80-column formats, the firm said.

An optional Delta Head model is capable of reading both types of cards. The unit comes in either table top or rack-mounted configurations and features a 50/60 Hz input and a universal power supply.

OEM prices are \$1,095, the firm said from 1850 Gravers Road, Plymouth Township, Norristown, Pa. 19401.



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Minicomputers at NCC

Univac

NEW YORK — Univac will demonstrate its most recently introduced minicomputer, the V77-800, along with the largest member of the Univac BC/7 minicomputer family and the UTS 400 intelligent terminal in Booth 2408.

The V77-800, announced last December, is intended for scientific and commercial users, operating as a stand-alone system or as part of a distributed network with Univac or IBM mainframes, the company said.

The 800 will support 128K to 2M bytes of 600 nsec semiconductor memory. The system displayed here will have 512K bytes of memory.

Included in the configuration are a 9.34M-byte disk memory, a character printer, a magnetic tape, a 285 card/min card reader, two asynchronous buffered terminals, two 3270-compatible terminals and two Univac UTS 400 buffered synchronous terminals with diskette and a character printer, Univac said.

Two applications software demonstrations are planned, one featuring Pronto, a data base/data communications package, and one featuring Prisms, the American Computer Sciences package. Prisms is an interactive real-time inventory and sales management system for wholesale/retail distributors and is available only on V77 minicomputers, according to the manufacturer.

A typical V77-800 system with a CPU, 256K bytes of memory, eight asynchronous CRT terminals, a floating-point processor, 60M bytes of disk storage, a 300 line/min printer, a 75 in./sec, 800- to 1,600 bit/in. magnetic tape unit and the Summit operating system sells for \$135,000, Univac said.

The same system with twice the memory, twice as many terminals and Cobol, Fortran and Total data base management software costs \$181,000.

The BC/7-800 small business system, linked to a remote printer, will be exhibited with 128K bytes of main storage, 20M bytes of disk storage, two 1M-byte diskette drives and a 250 line/min printer. The system can have up to four remote printers and a local printer running concurrently, depending on the job mix.

The system can produce printed reports, invoices, inventory lists and nu-

merous other forms of hard copy at distances of up to 1,000 ft via cable attachment or at indefinite distances via private or public telephone lines, Univac said.

The system can accept up to six 1,920-character CRTs with keyboards. Data can be entered without punched cards using a "fill-in-the-blanks" approach, and a variety of applications



Univac BC/7 Computers

programs have been prepared for the system.

BC/7 programs use RPG-II language. The Escort programming language allows the user with no programming expertise to specify data management requirements with a tutorial technique and enter program statements directly.

Standard BC/7 applications can be customized to suit the needs of the user using a technique called Pixie, whereby individual requirements may be incorporated into an application program through an interactive question and answer method, the company said.

The BC/7 models 600, 700 and 800 typically cost \$25,000 to \$34,000.

The Univac Universal Terminal System 400 (UTS 400) will be demonstrated with its recently added magnetic stripe reader. It can operate as a remote terminal or as part of a cluster of stations.

Applications include data entry, DP, control and monitoring, conversational interaction and off-line operations. The magnetic stripe reader re-

stricts access to authorized persons, and it can be attached to any UTS 400 keyboard, Univac stated.

Upon verification, the host unlocks the keyboard to permit entry of data.

The primary benefits of the UTS 400 are user programmability, peripheral sharing, buffered peripherals transfer, keyboard control of peripherals, extensive data editing capabilities and screen control.

As a remote station, the 400 can provide single-station capability with the option of attaching two additional slave stations. For a larger cluster arrangement, a terminal controller interfaces up to six slave stations to a single modem or multiplexer. The 400 is capable of controlling impact and non-impact printers, tape cassette units and diskettes.

Displays are offered in either 64- or 96-character Ascii sets, and character sets are available in Spanish, Danish/Norwegian, Swedish, French and Japanese.

Maximum system memory size is 65K bytes, a combination of read-only memory and random-access storage.

Screen formatting, input validation and I/O function are greatly simplified with the screen management system (SMS 400), which provides a set of control routines that interface with the firmware to support programs written in MAC/80 assembler language.

A basic UTS 400 configuration consisting of a master station with 24-line by 80-character display, communications interface and magnetic stripe reader leases for \$420/mo over a five-year term and can be purchased for \$15,664.



Wang Laboratories, Inc.

NEW YORK — Wang Laboratories, Inc. will announce products and software enhancements for its existing VS system product line in Booth 4300.

"We intend to announce significant new products that will reemphasize Wang Laboratories' position as a leading manufacturer of computer and word processing systems," according to Dr. An Wang, the company's president.

No Hints

The company would not discuss the products it intends to announce at the show.

As for enhancements to the VS product line, Wang claimed the resultant systems will have computing power equal to that of the IBM 370/158, including enhanced memory capacity, upgraded on-line storage capacity, the ability to handle additional workstations, enhanced language support and program and data compatibility with existing VS products.

Wang is at One Industrial Ave., Lowell, Mass. 01851.

GRI Computer Corp.

NEW YORK — GRI Computer Corp. will be demonstrating Grip, a small business system, at NCC.

All business information is contained in a single master data base and a user can choose application software modules that allow the processing of accounts payable, accounts receivable, payroll, inventory, order entry, bill of materials and general ledger.

Additional software packages including word processing and management decision-making support are available.

Grip is an interactive business com-

puter using conversational English. As transactions occur, the user can enter, retrieve or update the information.

The system can be operated by the nonprofessional. Grip operates with an on/off switch and a run switch.

Grip comes with two disk drives and can be expanded up to four drives. It includes a printer-keyboard combination that prints up to 132 char./line. A larger model Grip comes with a CRT and a separate printer.

GRI is at 320 Needham St., Newton, Mass. 02164.

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Minicomputers at NCC

Lear Siegler, Inc.

NEW YORK — Lear Siegler, Inc.'s Data Products Division will introduce a multiuser small business system and a single-board minicomputer in Booth 2526.

The small business system comes in two models, the 1000/4 and the 1000/8, which allow four or eight persons to use the computer simultaneously, according to the com-

pany.

Both models consist of a 16-bit CPU, 32K to 64K words of dynamic random-access memory (RAM), four or eight Lear Siegler ADM-3A

dumb terminal consoles, a 180 char./sec printer and a 10M-byte cartridge disk memory.

Two software systems are available for the 1000 series systems. Educational Data

Systems, Inc.'s Interactive Real-Time Information System (Iris) and Information Processing, Inc.'s Blis/Cobol are both said to provide communications and multi-user capability to the system, and each can handle up to 16 separate terminals.

Terminals can be upgraded from the 12-in. diagonal, 24-line, 1,920-character ADM-3A to any of five smart terminals with varying degrees of programmability and operator conveniences, Lear Siegler said.

The 10M-byte cartridge disk includes 5M bytes of fixed and 5M bytes of removable capacity. Additional storage of up to four 10M-byte disk drives can be added to the systems. The price starts at \$21,000.

A 16-Bit Mini

The 415 Data Processor, a minicomputer consisting of a single 15-sq.-in. board containing a 16-bit CPU with a microinstruction cycle time of 200 nsec, was designed to provide flexibility for system development, the company said.

It includes 32K or 64K words of memory with a memory cycle time of 600 nsec and a direct memory access channel.

The CPU and memory are housed in a six-slot card chassis that provides mechanical support and connectors for up to five additional boards for expanding I/O and other functions. It accommodates standard boards of the size and type available from Data General Corp. and other manufacturers and includes power units to supply the plus or minus 15V and plus 5V required to drive the fully expanded system.

Lear Siegler offers an optional I/O board that includes one serial synchronous and two serial asynchronous ports, a parallel I/O bus with 16 bidirectional lines to accommodate a 16-bit word length and a parallel printer port.

The minicomputer will sell for \$5,000.

The company also plans to show a \$1,450 smart CRT terminal with two pages of memory called the ADM-31; a CRT terminal, the ADM-42, which can be expanded to hold up to 16 pages in the memory, with a base price of \$1,795; and a 180 char./sec printer priced at either \$1,995 or \$2,045, depending on the configuration.

Lear Siegler is at 714 N. Brookhurst St., Anaheim, Calif. 92803.

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Minicomputers at NCC

Data General Corp.

NEW YORK — The whole family of Data General Corp. products will be on hand as two new DG computers make their public debut in Booth 2117.

The Nova 4/X scientific/technical computer and the MP/100 microprocessor will be unveiled for the first time during NCC, the company said. The Nova 4/X features a 256K-byte memory, a 20M-byte disk, a dual-mode tape drive, two Dasher displays and a TP2 terminal printer.

The MP/100 comes with a 32K random-access memory (RAM) board.

Three Eclipse scientific/technical computers will also be available for viewing.

The Eclipse S/250, with a 512K-byte MOS memory, a 50M-byte disk, a dual-mode tape drive, two Dasher displays and a TP2 printer, can be seen next to two other Eclipse models, the M/600 and the C/150.

The M/600 is the largest Eclipse, with 1M byte of memory, a 900 line/min printer, a magnetic tape dual-mode drive, a Dasher TP1 terminal, three Dasher displays, a Dasher LP2 printer and communications facilities.

The low-end Eclipse C/150 will be shown with 512K bytes of memory, dual-mode tape drive, a 50M-byte disk, three Dasher displays, and LP2 printer and communications facilities.

For the small business, DG will exhibit the CS/60 with a 256K-byte MOS memory, eight asynchronous ports, a 96M-byte disk, six Dasher displays, an LP2 printer, a 300 line/min printer and a dual-mode tape drive.

In addition, Digital Computer Controls, Inc., a DG subsidiary, will exhibit two of its small business systems

in Booth 2101.

The Model 1550 will be shown with 64K bytes of memory, a 30 char./sec Dasher printer and a 10M-byte disk subsystem.

The desk-enclosed Model 3700 will be presented with a 128K-byte memory, one Dasher display, a 10M-byte disk subsystem and a printer.

DG is at Rte. 9, Southboro, Mass. 01772.

NEW YORK — AM Jacquard Systems, in Booths 3012, 3014, 3016, 3018, 3038 and 3040, will demonstrate its J500 Videocomputer, a small business computer that can handle up to four hard disks and has the capacity for more than 50M characters of information.

The J500 consists of a 16-bit-word computer with a CRT, a keyboard and two flexible single- or double-density, single- or double-sided disk drives. Memory increments are available up to 128K bytes, and peripherals include line and character printers, cartridge disk drives and business software, a spokesman stated.

Jacquard will introduce at NCC a character generation capability for the J500 system that allows the user to create, display and print any set of characters needed, including sub- and superscripts, math and chemical symbols and non-Roman alphabets.

Finally, the company will unveil a binary synchronous communications capability contained on system-compatible diskettes. The first is a re-

Computer Automation, Inc.

NEW YORK — In Booth 1400, Computer Automation, Inc. will exhibit and demonstrate products from all three of its divisions. The exhibit will feature a minicomputer from the Naked Mini Division, Syfa network processing system from the Commercial Systems Division and an automatic test system from the Industrial Products Division.

In addition to introducing a low-end product line, CA will demonstrate a minicomputer system running one of the Naked Mini division's multiterminal operating systems. The show will include a static display of the Naked Mini 4 family of CPUs, memories and interface boards.

The Syfa display will feature the Microboosters — microprocessor-based front-end devices that increase overall processing power and throughput speed.

The Industrial Products Division will demonstrate the Model 4100 computer-controlled functional board tester.

CA is at 2181 DuPont Drive, Irvine, Calif. 92713.

Compucorp

NEW YORK — A desktop computer that is also a word processor — and an accounting system and an auto finance system and a business information system — will be shown by Compucorp in Booths 113 and 114.

The Compucorp 625 Mark II is offered with an extended Basic language operating system and up to 64K bytes of internal memory. With the complete array of controllers

available with the 625 Mark II, the computer can also be interfaced with a wide range of external printers, plotters and other devices, the company said.

Several special controllers allow the computer to be used for data acquisition and other scientific real-time applications, the company added.

Compucorp is at 1901 S. Bundy Drive, Los Angeles, Calif. 90025.

AM Jacquard Systems

mate job entry (RJE) program and associated driver for communications with a remote Univac mainframe.

The second is an RJE program and two associated drivers for communications with a single remote CPU. Both drivers automatically format the transmitted data in conformity with IBM 2780 or 3780 protocol; one assumes Ebcid control characters and the other assumes Ascii, the spokesman added.

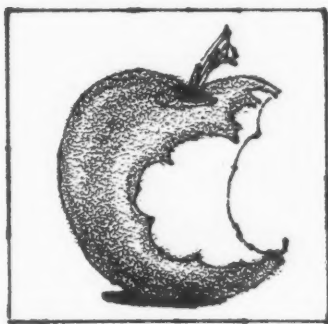
The firm will also unveil an RJE program and two associated drivers for communications with multiple remote CPUs. Both drivers automatically format the transmitted data in conformity

with IBM 3270 protocol, one assuming Ebcid and the other Ascii control characters.

Each bisynchronous communications diskette also contains several subsidiary utilities including an auto-answer program.

The binary synchronous drivers are entirely independent of the RJE program and support transmission of data with software written by the user in Jacquard's assembly language, Super Basic or in Data-Talk.

AM Jacquard Systems is at 1639 Eleventh St., Santa Monica, Calif. 90404.



Warrex Computer

NEW YORK — Warrex Computer Corp.'s line of Centurion business computers will be on parade in Booths 4111, 4113, 4115 and 4117.

A self-contained, diskette-oriented system is the smallest member of the family, and the systems range in size up through larger rigid disk configurations. Prices begin at under \$14,000.

Warrex generally markets the systems through a network of distributors, which currently covers 31 locations.

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Education: As a full-time aid to Computer Assisted Instruction programs, satisfying all levels of education

Transportation: Scheduling, supplying traffic and shipment status, routing, providing direct system access to a nationwide network of employees, and in some cases, access by priority customers such as airline club members

Retailing: Price and inventory data, shipping information, and credit authorization account status are among the many applications that serve this industry

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Minicomputers at NCC

General Robotics Corp.

NEW YORK — General Robotics Corp. (GRC) will feature the Constellation Series in Booth 4221.

The Polaris (the MVT/X3) is a system based on a Digital Equipment Corp. LSI-11 microprocessor; all of its peripherals are packaged in a single desktop unit. The system consists of an LSI-11/2 CPU, EIS/FIS arithmetic chip, 60M bytes of random-access memory (RAM), a triple-drive, 2.6M-byte floppy disk with hardware bootstrap, a full keyboard with numeric pad and a 12-line by 40-char. plasma display panel.

An RT-11 runtime software license is included in the manufacturer's list price of \$12,500.

The Gemini is a recent entry in the GRC product line. It is packaged with

compatible with LSI-11 Q-bus backplanes. It supplies 256K bytes to 2M bytes of block-structured storage with an access time of 3 microsec and data rates exceeding 500K byte/sec. The manufacturer's list price for a 256K-byte unit is \$3,750.

Pulsar CRT

Another entry to the Constellation Series is the Pulsar CRT unit, which emulates the DEC VT52, the Lear

Siegler, Inc. ADM-3, and the Hazeltine Corp. 1500. The unit is priced at \$1,250 and includes a full keyboard and numeric pad. The interface is RS-232C-compatible.

All of the Constellation Series products are fully compatible within the series and are Q-bus-compatible with most DEC modules and peripherals, including the LSI-11/23 CPU. All of the DEC RT-11 software products are compatible with the Constellation Series, the firm said.

The Constellation Series is rounded out by a series of LSI-11 modules including disk controllers, serial line interfaces, line printer interfaces, backplanes and system components.

GRC offers OEM discounts for quantities of two to 200 units or more per year. The discount at the 20 to 49 quantity level is 25%.

GRC is at 57 N. Main St., Hartford, Wis. 53027.



The GRC Pegasus

an LSI-11/2 CPU, EIS/FIS arithmetic chip, 60M bytes of RAM, a dual-drive, double-sided, double-density 2.52M-byte floppy disk with hardware bootstrap and a serial I/O port.

All of the above are contained in a 10.5-in.-high chassis suitable for a desktop or rackmount environment and include an RT-11 runtime software license. The manufacturer's list price is \$9,000.

Tristar Floppy

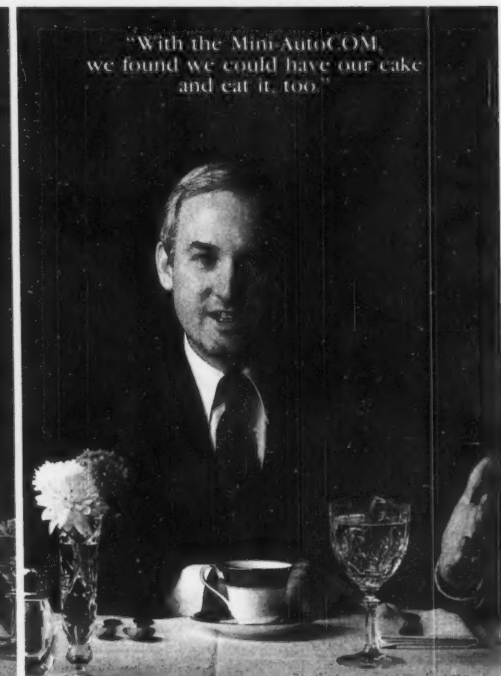
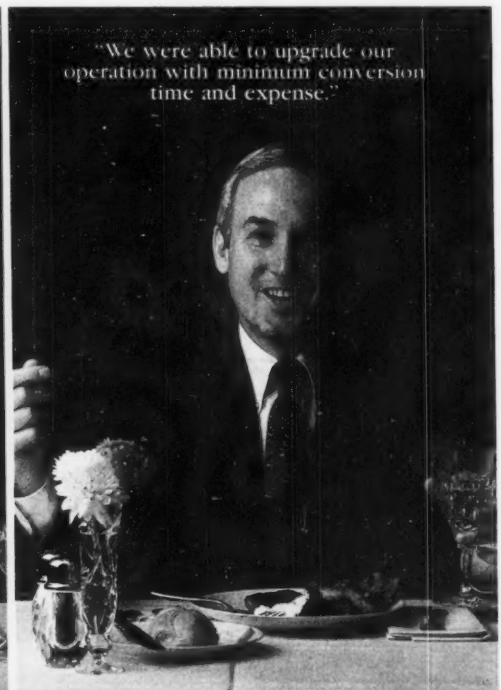
The Tristar (the FD/X3) is the GRC component floppy disk system. It contains an LSI-11/2 CPU, EIS/FIS arithmetic chip, 60M bytes of RAM, the FDV11 floppy disk interface and the hardware bootstrap.

The triple-drive, double-sided, double-density, 3.78M-byte floppy disk subsystem is packaged in a 10.5-in. high desktop or rackmount chassis. An RT-11 runtime software license is included in the package. The manufacturer's list price is \$10,000.

The Pegasus (CD/X3) is cartridge disk component system. The CPU is packaged like the CPU of the Tristar system, with an RKV11 cartridge disk interface replacing the FDV11 floppy disk interface.

The cartridge disk drive is configured as three fixed and one removable platters of the 2315 type and emulates eight RK05 logical units, with a total system capacity of 20M bytes. The system is capable of reading DEC RK05 disk cartridges.

The SDV-11 Superdisk has been christened Aries. This device is a solid-state disk emulator that is plug-



Minicomputers at NCC

Astrocom Corp.

NEW YORK — In Booths 363 and 364, Astrocom Corp. will introduce its Series 760 small business system.

This microprocessor-based system includes read-only memory (ROM) and variable increments of random-access memory (RAM). Also featured is a single or dual flexible disk drive subsystem and optional matrix printer.

User-programmable in the forms language or the business-oriented version of Basic, control programs provided

with the Series 760 include a system executive, drivers for the peripheral devices, a data set manager and system utility routines.

An optional communications package provides information transfer with a host processor at rates up to 9,600 bit/sec, using Binary Synchronous Communications (BSC) protocol.

The system, accessed via a keyboard for performing system utility operations, provides a device-to-device

transfer and flexible disk preparation.

The keyboard display unit offers system flexibility using a Zilog Z80 microprocessor, expandable memory, a flexible disk interface and a printer interface. The 88-key detachable keyboard features a numeric cluster, cursor positioning controls and function keys.

The 12-in. diagonal CRT, with P31 phosphor, displays 2,000 characters in a format of 25 lines by 80 characters.

The keyboard display can be interfaced with a matrix printer and flexible disk drive subsystem.

The flexible drive subsystem features one or two dual-density flexible disk drives, a power supply and a microprocessor based controller with parallel interface to the keyboard display unit.

Storage media consists of 7.88-in. diameter flexible disks contained in 8-in. square protective envelopes. Furthermore, each disk drive provides 512K bytes of storage for a total of 1M bytes of formatted storage for both drives.

Sold to OEMs and systems houses, the Series 760 will be priced on a quantity discount basis, the firm said.

Astrocom is at 120 W. Plato Blvd., St. Paul, Minn. 55107.

A DatagraphiX Interview

"COMPUTER OUTPUT MICROFILM OFFERED US A LOT MORE CONTROL, SAVED TIME, AND LOOKED FANTASTIC ON OUR P&L REPORT."

DatagraphiX recently spoke with Mr. James Hamrick, President, Service Division of Datatel, Inc., Alexandria, Virginia, about his company's decision to move to an in-house COM system.

DATAGRAPHIX: "Jim, why did you decide on a DatagraphiX system instead of going to a COM Service Bureau?"

HAMRICK: "It turned out that an in-house operation was the most cost-effective solution to handling our COM requirements. With a DatagraphiX minicomputer driven COM unit we were able to upgrade our operation with minimum conversion time and expense. We ended up with excellent control, higher quality output and lower operating costs than we ever expected."

DATAGRAPHIX: "What do you mean by control?"

HAMRICK: "We're able to maximize COM's full cost saving potential by having the equipment in-house. It's here 24 hours a day, allowing immediate turnaround. Each day's data is processed onto fiche that night and returned the next morning."

DATAGRAPHIX: "By going in-house, what

happened to your overall costs?"

HAMRICK: "We've found that the more we use our in-house system, the more we save. It costs next to nothing to add an entirely new job. So we've been using it for a lot more applications. Overall, our monthly savings have continued to increase even though we've greatly expanded our volume."

DATAGRAPHIX: "Are operator costs included in those monthly savings?"

HAMRICK: "No. Because DatagraphiX equipment is highly automated, our regular computer operators can now manage our COM production as well. We also have a DatagraphiX duplicator that simplifies the collation and distribution of microfiche copies."

DATAGRAPHIX: "Was operator training difficult?"

HAMRICK: "Not in this case. The Mini-AutoCOM is simple to operate. Our current staff picked it up in no time. DatagraphiX came in and showed us everything we needed to know."

DATAGRAPHIX: "Why did you buy a system instead of leasing one?"

HAMRICK: "We decided to buy for the immediate return on our capital investment, which, by the way, is good. The monthly lease payments were attractive, but for us, buying outright and taking advantage of the investment tax credit was the way to go."

DATAGRAPHIX: "Any regrets with the decision to go in-house?"

HAMRICK: "None at all. With the Mini-AutoCOM, we found we could have our cake and eat it, too."

For further information on how DatagraphiX COM systems can help you in a big way, call or write for our free brochure.

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(714)291-9960, Ext. 581, TWX (910)335-2058.

Basic/Four Corp.

NEW YORK — A number of hardware and software packages designed for business applications will be demonstrated by Basic/Four Corp. in Booth 4400.

The firm's multiterminal programmable business computer, the system 410, will be displayed with 40K bytes of memory, a high-speed 14M-byte disk storage system, a CRT and a bi-directional printer.

In addition to on-line storage, the system uses a magnetic tape cartridge drive with a removable 9.2M bytes of storage for backup and off-line storage.

The 410 runs on Basic/Four's basic operating software system (Boss). Boss consists of a disk-oriented real-time executive and an interpreter for executing the Business Basic language, a spokesman said.

The price of a minimum-configuration 410 is \$32,500.

The California-based company will also be exhibiting its system 200 accounting package, which includes inventory control, order processing, general ledger, payroll and accounts receivable functions; the system 730 for on-line multitasking tasks; and the system 610 for business data management environments.

Minimum configurations of the 200, 730 and 610 systems include CPUs, interactive input terminals, disk memory and printers, the spokesman noted.

Finally, Basic/Four will be demonstrating its Dataword software package, which allows users of the firm's 610 and 730 systems to do data and word processing concurrently using the same data base. The package can draw on a large, hard-disk storage capacity using 35M- or 75M-byte spindles, providing a large volume of text storage, the spokesman said.

In addition, the computer's random-access memory makes it possible to input and receive data in any order desired.

The Dataword software is priced at \$12,500. Basic/Four can be reached through P.O. Box C-11921, Santa Ana, Calif. 92711.

DatagraphiX a General Dynamics subsidiary
DatagraphiX® is a registered trademark of DatagraphiX, Inc.

Minicomputers at NCC

NEC Information Systems, Inc.

NEW YORK — NEC Information Systems, Inc. will show the four software-compatible computer systems that make up its Astra family of computers, along with its Spinwriter printer and Trimliner printers.

On display in Booth 4500, the Astra family ranges from the Model 210 — a system with a single CRT station, a main memory of 128K bytes, one to four NEC diskette storage subsystems, a 1M-byte diskette drive, a printer and

a price of \$13,200 — to the Model 2670, which supports up to 32 operator stations working concurrently, has a main memory of 512K bytes and is priced beginning at \$53,780.

In the middle of the lineup are the models 230 and the 250, with starting prices from \$17,080 and \$38,980, respectively.

All NEC systems software, compiler languages, applications software, data management capabilities and extensive

utility routines are available with each of the four models.

Optional data communications support is available on all models as well. The support ranges from a single fully duplexed line on the Model 210 to eight lines on the Model 270, the company said.

The Model 5500Q Spinwriter printer — a microprocessor-controlled serial impact printer — is plug-compatible with Qume Corp. character printers.

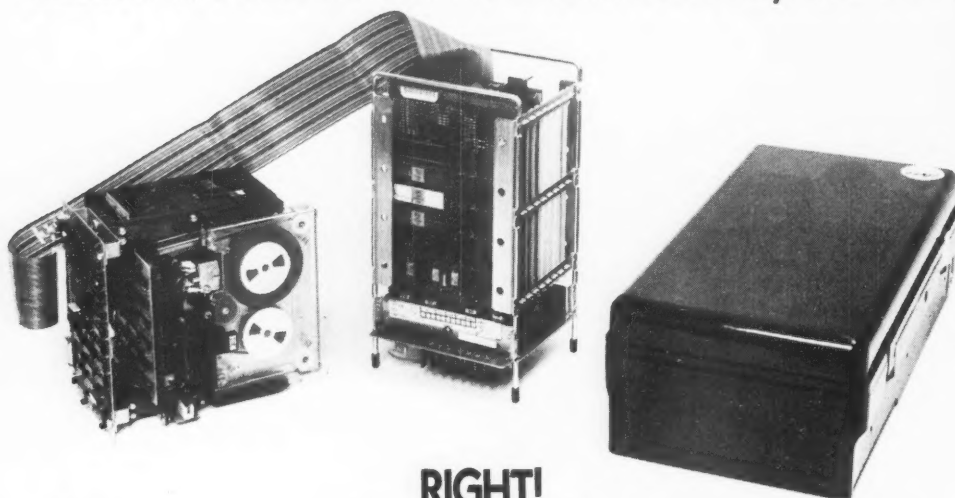
NEC provides the programming information required to adapt the printer to the user's system.

The printer uses the character print "Thimble" that contains up to 128 characters and costs \$2,160 in end-user configuration. The mechanism costs \$1,140 in 100-unit lots.

The 5500Q operates at 55 char./sec. It offers configurations of 10- or 12 char./in. with proportional spacing and can print subscripts and superscripts.

Fine-line graphing and plotting is accomplished with a high-resolution positioning accuracy of 1/120-in. hori-

GIVE THE LSI-11 MICROCOMPUTER, CARTRIDGE TAPE AND WINCHESTER DISC CAPABILITIES AND THE RESULT WOULD BE ONE HELLUVA SYSTEM, RIGHT?



RIGHT! AND IT'S ALL IN OUR INTELLIGENT CONTROLLERS.

U.S. Design Corporation announces the availability of microprocessor based DMA controllers that interface the DEI model 3400 Cartridge Tape and the IMI model 7710 Winchester Disc Drive to the LSI-11/2 and 23 CPUs.

Microprocessor technology for peripheral controllers offers several obvious benefits:

- Intelligent controllers reduce CPU overhead
- Greater I/O efficiency via 16K buffer
- Lower cost

USDC's LSI-11 peripheral controllers are designed to accommodate configuration growth, allowing for expansion of up to eight (8) tape drives and sixteen (16) disc drives.

The DEI cartridge tape and controller provides for 15 megabyte storage, after formatting, with very sophisticated error correction coding. The data is accessible in both sequential and random modes.



100 Severn Ave., Suite 102
Annapolis, MD 21403

The IMI Disc drive and controller provides formatted storage for up to 11 megabytes, utilizing the same sophisticated error correction code scheme.

In the future USDC will be announcing additional microprocessor based hardware and software products that will be cost effective innovations for OEM systems houses and the sophisticated end-user.

For additional product information write or call (301) 261-2115.



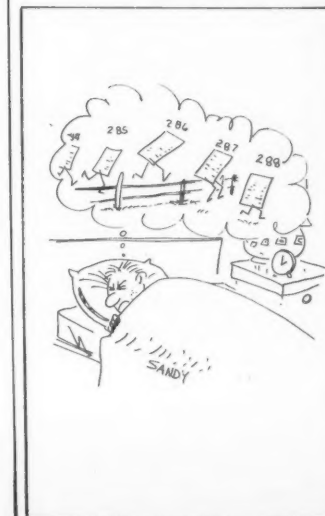
The Astra Series

zontally and 1/48-in. vertically, with a total of 5,760 plot points per sq. in., the company claimed.

NEC will also show seven types of software. Its interactive executive system provides a fully protected multi-user environment that encourages maximum usage of transaction processing facilities or mixed transaction and batch processing operations.

The data management system provides formatted data entry, file management capabilities, report generation and English-like inquiry facilities. Simple operator screen prompts make the system usable with minimal training, the company said.

Among the other packages available are five file-structure options, a business applications subsystem, more than a dozen utilities routines and communications software. NEC is at 5 Militia Drive, Lexington, Mass. 02173.



Mini Peripherals at NCC

Priam Corp.

NEW YORK — Priam Corp. will introduce a Winchester disk drive for small business computer manufacturers at NCC.

Designated the Diskos 3350, the OEM drive uses a servoed voice coil positioner to achieve a capacity of 33M bytes on a single 14-in. disk.

Succeeding versions of the Diskos 3350 will have capacities of 66M- and 154M bytes, the company said.

The 3350 measures 7- by 20 in. and weighs 33 lbs.

A brushless dc spindle drive motor eliminates the mechanical brake common to Winchester disk drives and permits the unit to be used in systems requiring all-dc power. An optional power supply can be included in the drive envelope.

A proprietary internal air-filtering system and breather filter design

prevent contamination of the system by external air, even if the head disk cavity seals were to leak, the company claimed.

In the 33M byte version, the Diskos 3350 sells for an OEM price of \$1,800 each.

Priam is located at 20730 Valley Green Drive, Cupertino, Calif. 95014.



NCC '79

Okidata Corp.

NEW YORK — Booth 3610, occupied by Okidata Corp., will spotlight a desktop printer designed for small computer systems and a series of Winchester-type disk drives.

Although details on the two new products were not available at press time, the company revealed that the disk drives will be based on IBM 3350 technology and have a greater ability to store data than the Okidata 3300 series.

Okidata will also be exhibiting its Slimline series of line printers, the CP210 document passbook printer and the 3300 disk drives.

The Slimline printers are available in 125-, 160-, 250- and 300 line/min models. They feature program-controlled font selection, stored program diagnostics and a choice of plug-compatible interfaces.

The 125- and 250 line/min models are also available with a graphics capability, permitting the printing of graphs, bar codes and charts in addition to conventional text.

The CP210 printer handles forms of varying size, thickness and format without operator adjustment, a spokesman continued. Options include an integral journal printer for recording and verifying each transaction.

The company's 3300 disk drives are manufactured in seven models from 13.47M to 80.8M bytes, and the Winchester-type units occupy only 7 in. of rack space complete with power supply, Control Data Corp.-type interface and optional fixed heads.

Okidata is located at 111 Gaither Drive., Mt. Laurel, N.J. 08054.

Rianda

NEW YORK — Rianda Electronics, Ltd. will display its PE/GCR (6,250 bit/in.) tape subsystems for minicomputers in Booth 366.

Complete subsystems are available for Data General Corp.-type minis, Rianda said.

Also available are formatter/disk combinations that emulate industry-standard formatter inputs which mate with existing customer-designed adapters.

Prices range from \$33,400 to \$35,000.

Rianda Electronics is located at 2535 Via Palma, Anaheim, Calif. 92801.

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Timeplex

Mini Peripherals at NCC

Shugart Associates

NEW YORK — Shugart Associates will show its floppy disk, fixed disk and minifloppy disk drives in Booth 1200.

The SA800/801 series drives have a patented diskette clamping/registration design that eliminates damage to the diskette from misrepresentation. It guarantees more than 30,000 interchanges with each diskette, single- and double-density capability on the same drive for the same price of approxi-

mately \$420 per drive in quantities of 250 to 499.

The SA850/851 diskette storage drives are enhanced double-headed versions of the company's SA800/801 drives and provide up to four times their on-line storage capability, faster access time and lower heat dissipation along with improved reliability and maintainability, the company said.

The proprietary Fasflex actuator uses a flexible band for low-friction head

movement and 3 msec track-to-track access time. The read/write heads are mounted on a newly developed head carriage assembly that allows the heads to be loaded simultaneously on both sides of the diskette.

Load Pad Eliminated

The head load pad is eliminated. Simpler actuator and head carriage assemblies were designed to reduce maintenance and increase ease of ser-

vice. The cost is \$585 to \$600 per drive in quantities of 100 to 249.

The SA400 minifloppy disk drive is intended for use where tape cassettes would have previously been considered, Shugart stated. It utilizes the larger SA800 series read/write head and a SA800-2-style interface for system upgrade.

The SA400 can be used in work processing systems, entry-level microprocessor systems, intelligent calculators and other applications where low-cost entry-level random-access data storage is a requirement, Shugart said. The unit is priced at \$255 and \$320 for the SA450, a double-sided, double-density system, both in 100 to 249 quantities.

Fixed-Drive Systems

Shugart's SA4000 series of fixed-drive systems will be on display here. They feature Winchester head and media technology, available in 14.5M- and 29M-byte versions (unformatted).

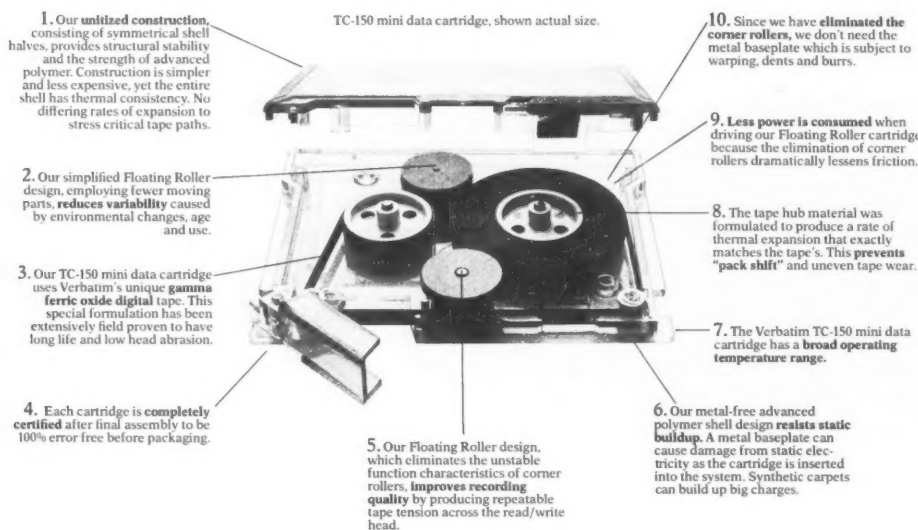
The SA4000 drives use an interface similar to that used in the SA800 series disk drives and a single power supply can be used for both types of drive system since both have the same voltage requirements, Shugart said.

Eight optional fixed heads are also available to provide an added 144K bytes of unformatted head-per-track storage for applications such as indexed files or table lookup. Prices range from \$1,450 to \$2,000 per drive in quantities exceeding 100 units.

Shugart Associates is headquartered at 435 Oakmead Parkway, Sunnyvale, Calif. 94086.

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Wespercorp

NEW YORK — Two controllers, two computer cabinets and an expansion chassis will be displayed in Booths 3046 and 3048 by the Western Peripherals Division of Wespercorp.

The first controller, the DC-233, is a storage module device that is designed to be used with Digital Equipment Corp. PDP-11 processors. The unit reportedly contains a miniature distributed processing architecture and can handle up to eight disk drives.

The TC-170 data cartridge magnetic tape controller is compatible with Data General Corp. processors and emulates DG's half-inch magnetic tape system. The controller manages up to eight drives and is structured for Iris and RDOS systems, a spokesman stated.

Cabinets on Display

Wespercorp's Wesperline Division will display the WP 974 and WP 975 4- and 5-ft. cabinets for DEC computers and the System 911 for use with DEC LSI-11 microcomputers. The latter enclosure is of rack-mountable design and includes a Q-bus backplane for the computer, switch group and power supply.

Wespercorp. is located at 1100 Claudina Place, Anaheim, Calif. 92805.

Mini Peripherals at NCC

Emulex Corp.

NEW YORK — Emulex Corp. will display its large-capacity disk drive controller for the DEC LSI-11 microcomputer in Booths 344 and 345.

The microprocessor-based SC01 controller family includes three models that are compatible with DEC software and allow users to add as much as 500M bytes of hard disk storage capacity to their LSI-11 systems, Emulex said.

The SC01/A controller emulates the DEC RP11/RP02/RP03 subsystems; the SC01/B emulates the RH11/RM02/RP04/RP05/RP06 subsystems; and the SC01/C emulates the RK611/RK06/RK07 sub-

systems.

All basic models of the SC01 series are priced at \$3,250 in quantities of 50 units.

All three models have been designed to offer performance characteristics identical to DEC PDP-11 controllers and will execute all DEC operating systems and diagnostic software without modification, the company said.

Also on display will be Emulex's TC-11 microprocessor-based tape controller. This unit is compatible with TU10-TM11 systems for PDP-11 users.

The TC-11 may be used with in-

dustrial-standard reel-to-reel magnetic tape drives up to 125 in./sec speed. It can be installed in just one (NRZ) or two (phase-encoded and dual-density) existing SPC slots of the user's backplane or system unit.

The TC-11 executes all DEC PDP-11 system and diagnostic software without modification, Emulex said.

The TC-11 is priced at \$2,250 (NRZ) and \$2,700 (phase-encoded and dual-density) in quantities of 50 units. Emulex is located at 17785 D Sky Park Circle, Irvine, Calif. 92714.

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Monolithic Systems Corp.

NEW YORK — Monolithic Systems Corp. will display its line of Digital Equipment Corp.-compatible memories and Multibus-compatible microcomputer products in Booths 2631, 2633, 2635 and 2637.

Included in the company's DEC-compatible memory line are add-on memories for the LSI-11, PDP-11 and PDP-8 CPUs.

The Multibus-compatible single-board computer offers the advantages

of the Zilog, Inc. Z80A instructions set plus 32-bit floating-and fixed-point arithmetic, the firm said.

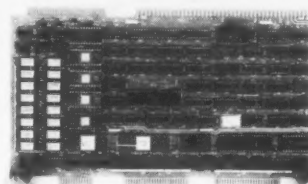
Designed the MSC 8004, the microcomputer will operate in a multi-master system with either serial or parallel priority bus resolution. Its architecture supports both the external Multibus and an isolated internal bus.

These two buses allow operation by other bus masters concurrently with memory and I/O operations on the internal bus. The reduction in the traffic load allows multimaster systems to operate with higher throughput, the firm claimed.

An on-board AM9511 arithmetic processor provides 32-bit floating-and fixed-point arithmetic operations. The MSC 8004 can accommodate 16K or 32K bytes of dynamic random-access memory (RAM) and up to 16K bytes of erasable programmable read-only memory (Eprom); 32K bytes of read-only memory (ROM) can be obtained using 8K masked ROMs.

The four on-board Eprom/ROM sockets allow intermixing of memory elements of different capacities between the first and last three sockets.

Another feature of the MSC 8004's



The MSC 8004

memory is dual memory maps. This option permits operation under the control of two independent memory maps.

The system can power up under the standard map, placing Eprom at low memory and RAM at high memory. Once initialized, the two memories can be flip-flopped, returning RAM to location zero.

The MSC 8004 costs \$1,440 with 16K bytes of RAM, AM9511 and all I/O elements. The firm is located at 14 Inverness Drive E., Englewood, Colo. 80112.

YES.

Yes, we'll be at NCC — Booth 439, NY Hilton.
Yes, we'll be showing Hazeltine CRTs.
Yes, we'll also be showing TI, Anadex and DEC printers.
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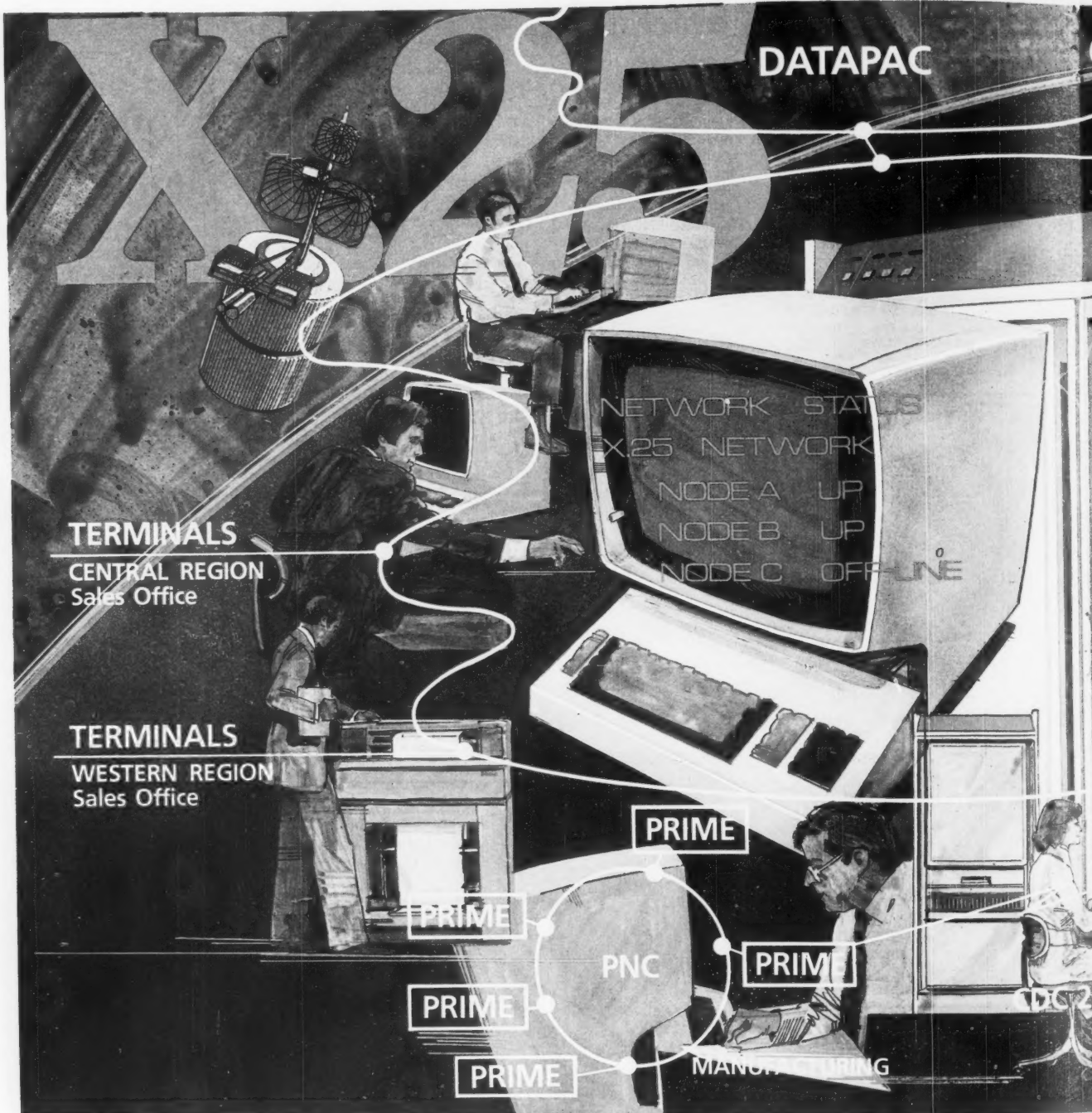
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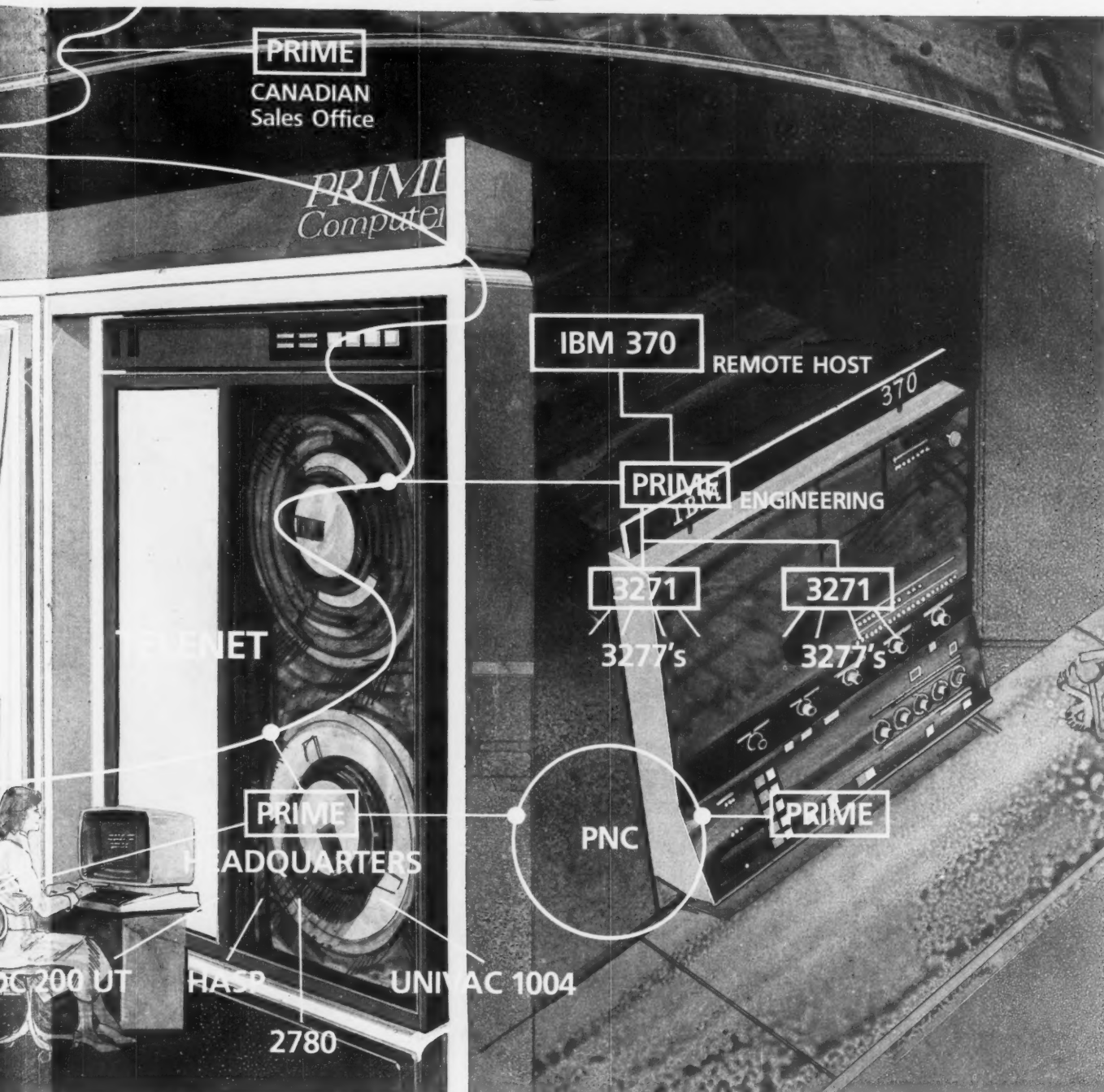
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PRIME® Computer

Mini Peripherals at NCC

Plessey Peripheral Systems

NEW YORK — Booths 4032 and 4034 will be the scene of demonstrations of a group of peripherals designed for minicomputer users by Plessey Peripheral Systems.

The PM-DX11C is an asynchronous interface that can be used to connect the Digital Equipment Corp. PDP-11 to eight serial communications lines. The eight-line configuration consists of a single hex-wide circuit board, a 5.25-in. distribution panel and interconnecting cables.

The PM-DLV11J is a dual-wide logic board with a Q-bus interface for up to four serial lines which can be RS-232-

RS-422- or RS-423-compatible. Designed for the DEC LSI-11 microprocessor, the unit appears as four different PM-DLV11s to the software and is therefore compatible with existing software, Plessey said.

The PM-RF11 is a fixed-head disk emulator with a capacity of up to 4M bytes. The unit uses 16K MOS random-access memory technology with error checking and correcting circuitry built in.

The unit is said to be available with DEC operating system drivers and comes in a minimum size of 512K byte.

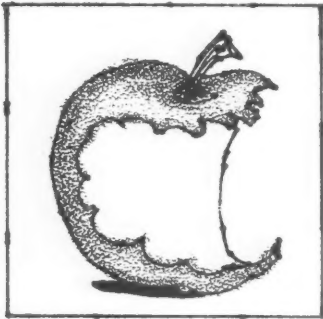
The PM-KK11A is a 1K-word cache memory for use with the PDP-11/34A central processor. It consists of a hex-wide circuit board which resides next to the processor and simulates a system with large amounts of moderately fast memory, Plessey said.

The firm will also be introducing Micro II, a general-purpose microcomputer system designed for small business environments. It is based on the LSI-11 processor and includes two floppy disk drives, single or dual density, and has the capability of supporting a 5M- or 10M byte hard disk subsystem.

The central processor and floppies are housed in a 10.5 in. enclosure.

The floppy disk subsystem is media- and software-compatible with the DEC RXV11 single-density or RXV21 dual-density floppy disk subsystems, the firm said. The drives are controlled by Plessey's PM-XCV11 single-density or PM-XXV11-A dual-density floppy disk controllers, which mount on the CPU backplane.

The system can be purchased with optional operating system software including LSI-11 software and Plessey's LSX-11M operating system, Plessey said from its headquarters at 17466 Daimler Ave., Irvine, Calif. 92714.



Trendata Corp.

NEW YORK — A semiconductor memory that is pin-compatible with the Digital Equipment Corp. PDP-11/70 minicomputer will be featured by Trendata Corp.'s Standard Memories Division.

The Pincomm 705 uses the DEC memory system chassis, MK-11, and requires no modification to the existing DEC hardware, Trendata said. The capacity of the card is 256K bytes; up

to 16 Pincomm 705 can be installed in the MK-11 chassis.

The unit features an on-line/off-line switch, two LED indicators for "run" and "power on", two on-board spare random-access memories and compatibility with battery backup and CPU-controller margin testing.

The firm is located at 3400 W. Segerstrom Ave., Santa Ana, Calif. 92704.



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Micros at NCC

Cromemco, Inc.

NEW YORK — A random-access memory (RAM) card, a single-card microcomputer, a microcomputer system and a multiuser software system are expected to be shown by Cromemco, Inc. in Booths 8, 9, 10 and 11.

An S-100-compatible, 64K-byte read/write memory board incorporating 16K-byte RAM chips with 150 nsec access times helps achieve high-density and high-speed operation, the company stated.

The card is intended for use in a Cromemco Multiuser Basic system and is said to time-share up to seven different Basic programs resident in the same

sional work in the fields of engineering, science, business and accounting, word processing, data base management and education.

System Configuration

The system consists of a Z80-based microcomputer, two 16K cards of RAM that are expandable to 512K bytes, an RS-232 interface, a parallel printer interface, a CRT terminal and a 132-column printer.

A Prom programmer for development work, an additional dual disk drive and additional memory are optionally available.

The System Three is available for \$5,990. An additional CRT is available in two models for either \$1,595 or with expanded capabilities, including line editing and block mode transfer, for \$1,995.

Cromemco is at 280 Bernardo Ave., Mountain View, Calif. 94040.



Cromemco System Three

S-100 bus system. Called the 64KZ, the memory card is organized as two independent 32K-byte memory modules.

Expansion up to 16M bytes is possible using the extended band select feature, a spokesman noted.

The card includes automatic 64KZ enable or disable after a system reset. It is available for \$1,785.

Complete Computer

Cromemco's single-card computer is a complete computer that offers 4 MHz operation, 8K bytes of on-board 2716 programmable read-only memory (Prom) and 1K byte of static RAM memory. It provides an RS-232 serial interface with programmable bit rates to 76K bits, 24 bits of bidirectional parallel I/O, five programmable timers and vectored interrupts.

A power supply and Prom software only are required for operation, the company said.

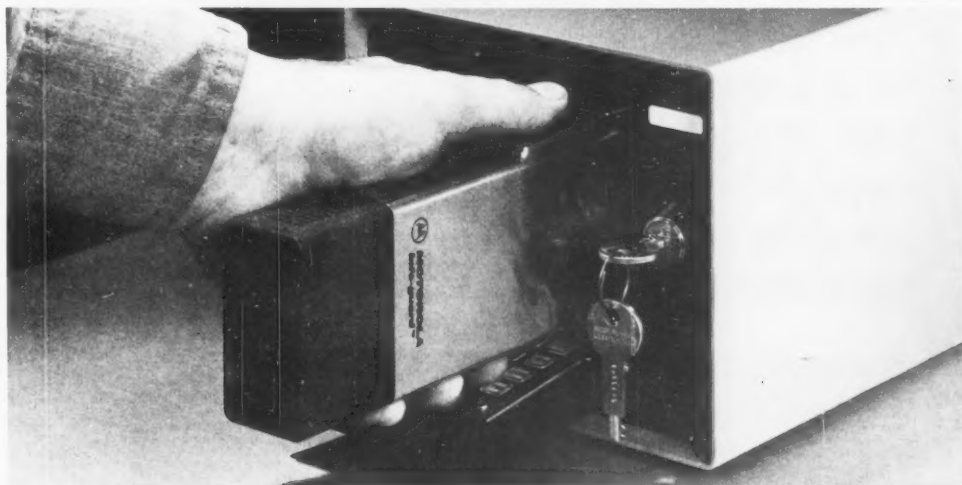
The single-card computer is compatible with all Cromemco cards and can be used as the core of a greatly expanded S-100 bus system that can include additional memory, I/O or even floppy disk drives as needed.

The single-card computer is available in kit form for \$395; assembled and tested, it costs \$450.

Z80 Monitor

The company's Z80 monitor and 3K control Basic are available in 2716 read-only memory (ROM) form for use with the single-card computer, making it possible to use the computer immediately without adding memory or I/O. The cost of the system is \$90.

Cromemco's System Three computer is intended for a wide range of profes-



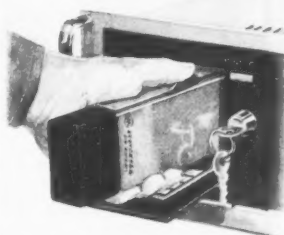
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Micros at NCC

North Star Computers, Inc.

NEW YORK — North Star Computers, Inc. will announce the availability of quadruple-capacity mini disk drives for its Horizon computer, increasing the Horizon's storage capacity to 360K bytes for each 5.25-in floppy disk. The quadruple capacity is also available on North Star's Micro Disk Systems.

The company, located at Booths 333 and 334, began shipping double-density versions of its disk systems

during the first part of 1979. North Star has contracted a disk manufacturer to supply what are believed to be the first quad-capacity drives available on the market.

The drives allow the system to record in double density on both sides of a floppy diskette and increase the on-line storage capacity of a standard two-drive Horizon MCPU of 720K bytes. A four-drive system accesses more than 1.4M bytes, North Star

said.

The North Star disk controller was designed to accommodate the increased capacity, and run existing programs with few or no changes, the company indicated.

With one quad-capacity disk drive and 32K bytes of random-access memory (RAM), the Horizon is priced at \$2,349. With two quad disk drives and 32K bytes of RAM, the price is \$2,999. More information is available from

North Star, 2547 Ninth St., Berkeley, Calif. 94710.

Intersystems, Inc.

NEW YORK — Intersystems, Inc. will exhibit its DPS-1 microprocessor in Booths 338 and 339.

The DPS-1 is the result of two years of development. The company said the unit is S-100-compatible, even at 4 MHz, and features a power supply of 25A at 8V and 5A at +16V, with individually fused dc outputs.

The DPS-1 also features a 22-slot shielded terminated motherboard and a 4 MHz Z80A MPU, with provisions for on-board read-only memory (ROM).

The unit's front panel includes address and data breakpoints, slow step, automatic stop, testpoints and internal diagnostics. The front panel is removable.

The unit also includes forced fan ventilation and a keylock for ac switched output.

The DPS-1 is priced at \$1,145, with OEM pricing available.

Other components on display will include an 8K-byte static random-access memory (RAM) memory board, a video display board, a prototype board, a Z30 MPU and the 2708/7216 erasable programmable read-only memory (Eprom) board.

Intersystems is at 1650 Hanshaw Road, P.O. Box 91, Ithaca, N.Y. 14850.

Ultra-Violet Products, Inc.

NEW YORK — Ultra-Violet Products, Inc. (UVP) will introduce an erasable programmable read-only memory (Eprom) erasing lamp in Booth 520.

The UVS-11E short wave UV lamp was designed specifically for the small systems user and computer hobbyist. The unit will erase up to four chips at one time in 20 minutes, the company said. The price of the UVS-11E is \$64.75.

Erasing System

UVP's erasing system, the S-52T, will also be shown. This lamp provides 3 ft of exposed, grid-formed tubing that will erase up to 16 chips at one time in approximately seven minutes.

Tube life is more than 10,000 hours. The price of the S-52T lamp, timer assembly and tray is \$269.

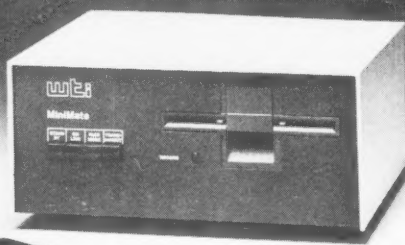
The UVS-54T is UVP's mid-priced erasing system, featuring a high-intensity 6W lamp that can erase up to eight chips at once. Tube life is rated at 5,000 hours. The price of the UVS-54T lamp, timer assembly and tray is \$134.75.

UVP is at 5100 Walnut Grove Ave., San Gabriel, Calif. 91778.

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dumb terminal
needs a
smart RS232
mini floppy



or your
smart terminal
needs a
dumb RS232
mini floppy



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DataMate adds powerful editing capability to your non-intelligent terminal without special program disks or complicated procedures to memorize. You can backspace-erase, insert, delete, modify, link and stop. A recordable "Go To" command allows jumping to random file locations for repeat and linking applications. Two Search Modes are also provided.

MiniMate especially compliments today's more intelligent terminals. It provides character edit mode for editing by character and data can be released one character at a time. It also features the recordable "Go To" command.

STORE & FORWARD TOO

DataMate and MiniMate help you cut ON-LINE costs. They communicate in batch mode or line-at-a-time mode at switch selectable baud rates from 110 to 9600 baud. Both units also feature auto line feed mode, interrupt mode and standby mode, and both respond to X-on/X-off controls.

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Power Supplies at NCC

Nova Electric Manufacturing Co.

NEW YORK — Nova Electric Manufacturing Co. will exhibit its uninterruptible power source (UPS) and its Taurus Series 15 KVA 400-cycle frequency changer at Booths 4104 and 4106.

Developed to meet the needs of the microcomputer industry, the Micro/Power Series UPS provides up to 250

W of regulated ac power. It was designed to provide precise conditioned power to computers, to filter the incoming utility power and to provide uninterrupted power during power failures of brownouts, the firm said.

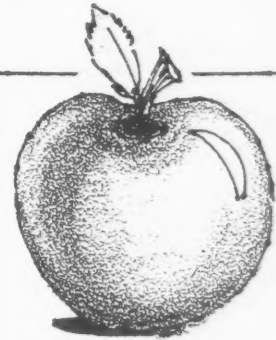
A 20-A, 12-V battery provides the power necessary to maintain a computer for 15 minutes. Batteries may be used in parallel for extended operation.

The Taurus features a stepped-wave design approach that results in a dynamic voltage regulation of less than -

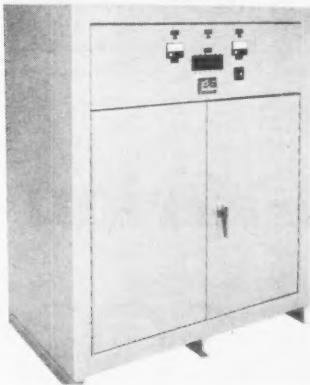
10% for a load change of 100%, the firm said. Distortion is also kept at low level as low level harmonics are not present.

By adding a rectifier/charger and batteries, a computer user may obtain an uninterruptible 400 Hz supply for applications where a service interruption is undesirable.

The firm is located at 263 Hillside Ave., Nutley, N.J. 07110.



NCC '79



Taurus Changer

Dranetz Engineering Laboratories

NEW YORK — Power monitoring equipment will be exhibited in Booth 425 by Dranetz Engineering Laboratories, Inc.

The Dranetz booth will highlight its Series 606 power line disturbance analyzer and Series 616 dc/ac voltage disturbance analyzer.

Both microprocessor-based instruments are used to differentiate between malfunctions caused by the computer or peripheral equipment and those caused by the power line, according to the company. Prices start at \$3,300 on most models.

The Series 606 monitors fluctuations on ac power lines and prints out information on impulses, sags, surges or slow average disturbances.

Because the unit operates on disturbance or command, paper consumption depends only on the number of disturbances or frequency of testing. A thermal printer eliminates the need to replace ink or ribbons, the firm noted.

Other features include power interruption standby and immediate and summary modes. To avoid data loss during printing, the 606 stores all information on up to 15 disturbances that may occur during a printout. After 15, the instrument continues to accumulate data, but in summarized form. When the printer is free, it prints the 15 disturbances.

While similar to the 606, the Series 616 monitors fluctuations simultaneously on both dc and ac voltage levels.

Dranetz is headquartered at 2385 Clinton Ave., Plainfield, N.J. 07080.

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Price: DIVA systems, while providing overall superior performance, are painstakingly designed for cost-effectiveness which routinely translates into system savings of 25% to 40% over original manufacturer systems.

Service: DIVA systems are supported nationally for service and parts by one of the most reputable third-party service groups in the country — Syntronics, a division of Control Data Corporation. From day of installation out to five years beyond availability of system.

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Eclipse Model _____ Interdata Model _____

P.S. I'm thinking of storage for _____ M/bytes.

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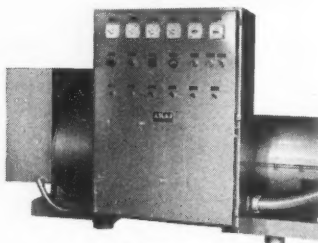
State _____

Power Supplies at NCC

Atlas Energy

NEW YORK — The Atlas Computer Powerpac and materials on power protection will be displayed in Booth 354 by Atlas Energy Systems, Inc.

The Powerpac eliminates voltage fluctuations, line transients and spikes, sags or surges, brownouts, momentary flickers and dirty off/surge-



Atlas Powerpac

on power malfunctions, the firm said.

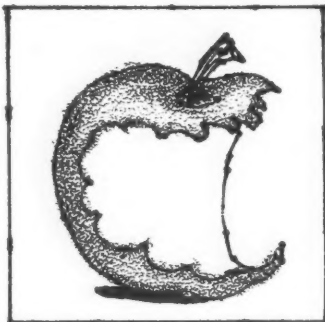
The units are available for delivery in six to eight weeks in sizes from 6-through 600 KVA, according to the firm, which is located at 9457 Rush St., S. El Monte, Calif. 91733.

International Power Machines

NEW YORK — "Front Access" power converters and uninterruptible power machines will be featured at the International Power Machines Corp. (IPM) Booths 4101, 4103 and 4105.

This series was developed by IPM in both 415-Hz and 50- to 60-Hz configurations.

IPM is at 3328 Executive Blvd., Mesquite, Texas 75149.



Exide

NEW YORK — A 415-Hz uninterruptible power source (UPS) from the Exide Power Conversion Division of ESB will bow here in Booths 3305 and 3307.

The system can be used for support of large mainframes that require 415 Hz power, including the IBM Series 30 CPUs.

It will be available in ratings of 80 kW beginning in the second half of this year. The average unit sells for about \$50,000, including a

15-minute Exide battery.

The UPS uses digital logic control, a common feature on the company's products.

The same high-efficiency commutation circuit used in the 50- and 60 Hz systems is used in the 400 Hz equipment, Exide said.

The logic control is modular and can be replaced with three printed circuit boards. Exide can be contacted at 3301 Spring Forest Road, Raleigh, N.C. 27604.

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Power Supplies at NCC

Emerson Electric Co.

NEW YORK — In Booths 1431 and 1432, Emerson Electric Co. will exhibit its 415-Hz uninterruptible power source (UPS). This was designed for the latest generation of processors that cannot operate from a standard utility.

The Accupower AP92 was designed to be used with IBM Series 30, Amdahl Corp; and Control Data Corp. CPUs.

Emerson is located at 3300 S. Standard St., Santa Ana, Calif. 92702.

NEW YORK — A variety of voltage regulation equipment, designed to protect systems from brownouts, blackouts and ac line power problems, will be featured in Booths 3035 and 3037 by General Signal's Sola division.

One of the products, an uninterruptible power source (UPS), combines voltage regulation, line isolation and wave-shaping as well as emergency power during line failure, a spokesman stated. Power for the protected equipment or system passes through the

Sola

UPS and battery bank in normal operation, so if the power line fails, the battery bank continues to supply the load from its own reserve of power.

Sola will also demonstrate its micro/minicomputer regulator for low-power, microprocessor-controlled equipment such as minicomputers, point-of-sale terminals, word processors and energy management instruments. The unit acts as a portable dedicated line providing voltage regulation plus transverse-mode noise attenua-

tion to 60 db and common-code noise attenuation to 120 db.

Information regarding Sola's products is available at the booth or from the company's headquarters at 1717 Busse Road, Elk Grove Village, Ill. 60007.

Emergency Power Engineering, Inc.

NEW YORK — Emergency Power Engineering, Inc. will demonstrate its line of power distribution systems in Booth 3621.

The devices distribute power to peripherals from a central point via flexible cabling, obviating the need for

Benson-Varian engineers set out to design a printer/plotter controller that would do it all. So we started from scratch.

The Graphware 1000 is microprocessor based. It is truly intelligent. It interfaces via a byte multiplexer channel, a block multiplexer channel, or a selector channel. And you can switch select any position on any channel.

Depending upon your initial need to off-load your mainframe, you have three choices of capability: Models 50, 51, or 52. All Graphware 1000 Series Controllers are upgradable in the field, simply and quickly. The greater the capability the less demand for mainframe time.

For example, the Model 52 accepts unsorted vectors, raster data and sorted vectors. With its built-in disk you can expand its sorting memory to a maximum of 64 K. This disk storage enables you to operate on-line or off-line. You can get up to 99 copies by simply pushing a button.

A very important plus, in addition to operating any two Varian printer/plotters on-line, the Graphware 1000 can also operate from a remote site over a standard telecommunications link at speeds up to 19.2 kb's.

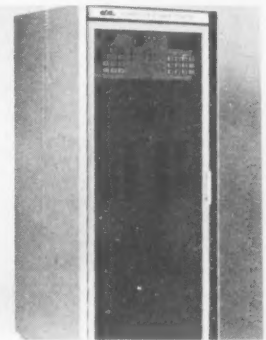
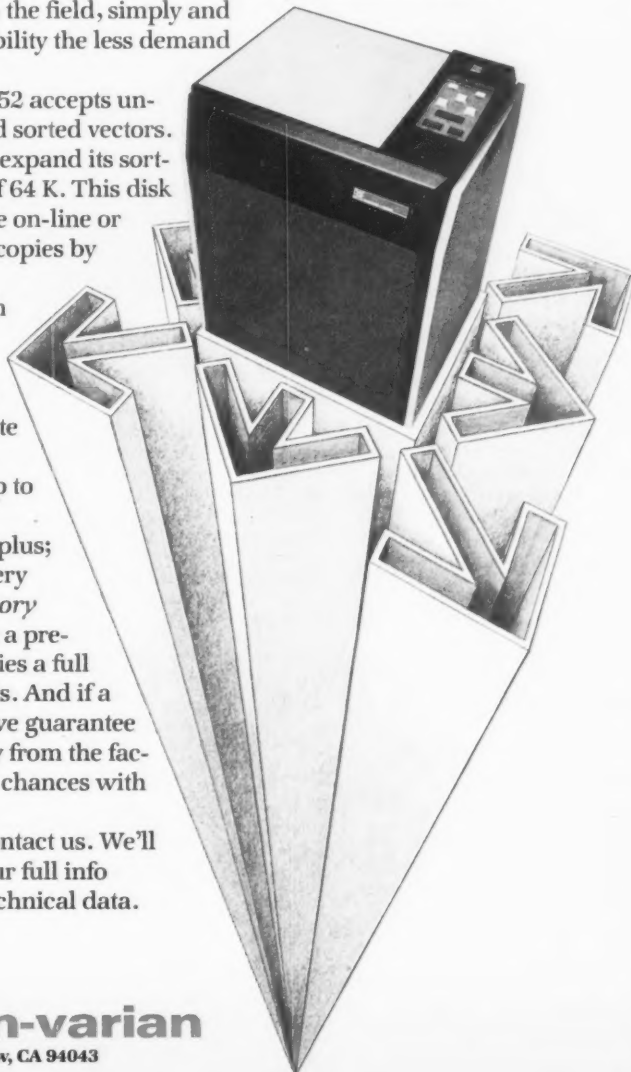
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The EPE Power Center

the rigid conduit commonly used, according to a spokesman.

The system requires the services of an electrical contractor only for the input junction box, the spokesman noted, which means that installation of the system typically can be completed in less than two hours. In use, the device monitors all output functions including power indicators, digital meters and emergency power switch.

Also to be exhibited, for the first time, is the company's Powerpac model, rated at 5- to 50 kVa. Other products in the company's offerings are rated at 15- to 200 kVa.

Emergency Power Engineering can be reached at 3595 Cadillac Ave., Costa Mesa, Calif. 92626.

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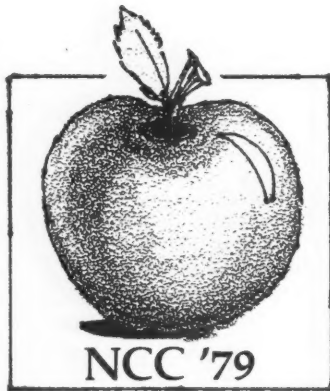


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... And Other Things to See



Prime Computer, Inc.

NEW YORK — Prime Computer, Inc. will show four large-scale minicomputer systems and the Prime Information Systems announced earlier this year in Booth 3412.

Prime will also demonstrate its networking capability, Primeret, and its distributed data processing subsystem, the Distributed Processing Terminal Executive (DPTX) with Prime's four Series 50 systems. The fully compatible Prime 450, 550, 650 and 750

systems will also be demonstrated.

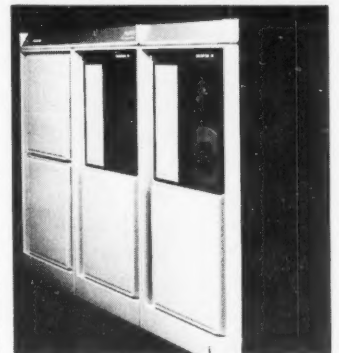
The Prime 750 will be the host system for the Prime 650, 550 and 450 systems connected to it. It will be connected with 2M bytes of main memory, two 300M-byte storage module disk subsystems, one magnetic tape drive, 10 CRT terminals and one 1000 line/min printer.

The Prime 650 and 550 systems will each be configured with 1M byte of main memory, one magnetic tape drive

and eight CRT terminals. The Prime 650 will be configured with an 80M-byte storage module disk subsystem, and the Prime 550 will be configured with a 64M-byte cartridge module disk system.

The Prime 450 system will feature 512K bytes of main memory, two CRT terminals and an electrostatic printer.

Prime will also exhibit its Prime information Systems, announced in March. Made up of standard Prime hardware and the Information software, these systems are available in two series, the Prime Information 1000



The Prime 750

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prove that TAPS reduces development time by an average of 44 percent, thanks to a host of time- and money-saving automatic features.

With TAPS, an application can be developed on a large mainframe, and then be moved to a stand-alone mini or used throughout a mixed network of CPUs. In such usage, TAPS is the common thread; applications are completely isolated from hardware and network considerations.

Today, TAPS-based products are portable among IBM mainframes (with CICS, IMS/DC, Westi, Datacom and Shadow), as well as these minis: DEC 11, Series 1, HP 3000, Perkin-Elmer, Harris and Tandem. The list keeps growing, in response to user demand.

These are just a few of the reasons that eight major software companies have decided to build 29

on-line products using a software system you never heard of. We'd like to present our case to you as well. For fastest action, call Art Esch at 800-223-6548 or 212-687-2660. Or use the coupon to let us know what your interests are.

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Contractual obligations prevent us from publishing the names of the 8 major software companies and the 29 on-line products. Information will be provided on request.

and 5000 systems.

Exhibited at NCC will be the Prime Information 1000, configured with 1M byte of main memory, one 80M-byte storage module disk subsystem, six CRT terminals and a 430 line/min printer.

Also exhibited for the first time will be Prime's distributed DP and networking offerings. The Primeret network communication capability will distribute the four systems' computer power according to user needs, providing complete local and remote network communication service, according to the company. Primeret facilities support the CCITT X.25 packet-switching interface standard.

Also to be shown are Prime's Distributed Processing Terminal Executive (DPTX) software products, which let users construct communications networks with equipment provided by Prime, IBM or IBM-compatible vendors. DPTX products conform to protocols used by IBM 3271/3277 CRT systems.

Prime is at 40 Walnut St., Wellesley Hills, Mass. 02181.

Matrix Publishers

NEW YORK — Matrix Publishers, Inc. will show its current line of publications aimed at the small system user in Booth 1017.

There will also be an exhibition at the Personal Computing Festival scheduled to run nearby at the same time. The firm is at 30 N.W. 23rd Place, Portland, Ore. 97210.

... And Other Things to See

Decision Data Computer Corp.

NEW YORK — Decision Data Computer Corp. will exhibit its 6540 serial printer, 3240 printer terminal and 6600 series of line printers in Booth 1105.

The 3240 and 6540 have a lot in common, the company said. Each model is bidirectionally smart and employs microprocessor and large-scale integration technology, with horizontal and vertical tabbing for high-speed stepping and skipping.

Characters are formed with a 9 by 7 dot matrix and printed serially at 120 char./sec. The character set consists of 96 symbols, including upper- and lower-case alphabets, numerics and special characters.

Both printers feature a 132-char. print line. Characters are printed 10 to the inch. Lines are spaced vertically six to the inch.

The company's 6600 series consists

of six line printers with speeds of 200-, 300-, 450-, 600-, 900- and 1,500 line/min. Each model in the 6600 series has these standard features: 132 print positions; operator selection of 6- or 8-line/in. vertical spacing; simplified control panels; full-access swing-open gates; and friction-free hammers.

Decision Data is at 100 Witmer Road, Horsham, Pa. 19044.

Ontel Corp.

NEW YORK — At Booth 4618, 4700 and 4702, Ontel Corp. will show a variety of products including its OP-1/R-W, which can be used as a word processing station in a clustered word environment, and the OP-1/50, which features five boards and a display microprocessor.

The OP-1/50 has a CPU memory board with up to 64K bytes of mem-

ory, a spokesman said.

The firm will unveil an operating system that allows multitasking under any currently available Ontel language. Under the operating system, word processing can be run as a task and other tasks can run concurrently with word processing.

Additional information on the products was not available at press time. Ontel can be reached through P.O. Box 267, Newtown, Pa. 18940.

Integrated Software Systems Corp.

NEW YORK — Integrated Software Systems Corp. (Issco) will introduce an enhanced version of the Disspla computer graphics software in Booth 3102.

Disspla is a device-independent system of Fortran subroutines that are called up by the user's program to produce two- and three-dimensional graphics. The latest version has the ability to note specifications in centimeters rather than inches. Priced at \$24,500, it also offers two new options: contouring and business graphics capabilities.

The contouring option, available for \$2,000, can devise constant elevation contour lines on a map or mathematical functions. This option complements the perspective viewing of surfaces, a feature of Disspla that has been available for some time.

The business features option, priced at \$5,000, is geared to financial and administrative applications, enabling the user to devise more advanced charts and annotations than were possible with earlier Disspla versions. Issco is located at 4186 Sorrento Valley Blvd., San Diego, Calif. 92121.

Evans & Sutherland

NEW YORK — Evans & Sutherland Computer Corp. will announce and demonstrate its three-dimensional graphics system in Booths 4431 and 4433.

The firm's graphics gear includes a high-resolution, shadow-mask CRT said to produce 449 distinct colors.

The system can be supplied with Evans & Sutherland's Picture System to produce three-dimensional dynamic image presentations, the vendor added from headquarters in Salt Lake City.

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... And Other Things to See

Integral Data Systems, Inc.

NEW YORK — Integral Data Systems, Inc. will occupy Booth 93 here with a demonstration of its Model 440 Paper Tiger impact printer system.

Designed for the OEM, the system costs \$995 in single-unit quantities, the firm said, and features software-selectable character sizes, a 96-char. Ascii set and 80- or 132-column formats.

The tractor-fed matrix printer also

has adjustable forms width, a choice of 6- or 8-line/in. vertical spacing, automatic multiline buffers and both the RS-232 serial and Centronics Data Computer Corp.-compatible parallel interfaces.

Transmission rates from 110- to 1,200 bit/sec are switch-selectable. The unit uses a stepper motor paper feed.

An optional 2K buffer/graphics

package is available for dot plotting graphics capability. The buffer can hold a full CRT screen of 1,920 characters, the firm noted.

The unit uses ordinary paper and it is capable of sensing the end of each print line to achieve throughput rates from 42- to more than 300 line/min, the firm added.

The firm is headquartered at 14 Tech Circle, Natick, Mass. 01760.



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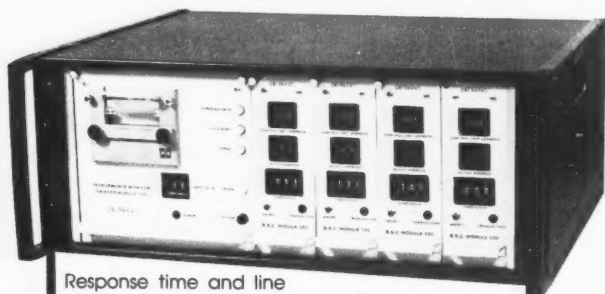
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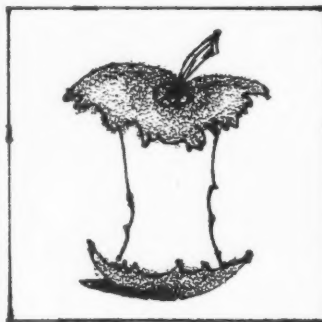
Vu-Data Corp.

NEW YORK — Vu-Data Corp. will show its small 50 MHz dual-trace oscilloscope in Booth 2001. It is claimed by the company to be the smallest scope with the brightest trace currently used in a unit this size.

Weighing less than 15 lb, the Model PS950A measures 4.2 in. by 8.5 in. by 15.4 in. The bright trace is the result of a 7 kV acceleration potential on a mesh CRT with a metalized screen. Internal graticule and small spot size give a sharply defined trace, according to the company.

The small scope boasts a 7-nsec rise time and rock stable presentation even of narrow, low rep rate pulses. The PS950A was designed for rigorous mechanical stresses and was made for use in field service applications, the vendor said.

The PS950A costs \$1,895 from the company at 7170 Convo Court, San Diego, Calif. 92111.



Lortec Power Systems, Inc.

NEW YORK — Lortec Power Systems, Inc. will exhibit its Continac uninterruptible power system line and announce a complimentary 50Hz line as well in Booths 1611 and 1613.

The company markets 14 systems designed to provide constant, no-break ac power and to guard against blackouts, brownouts, lightning and line transients.

A Continac system has three basic sections. A solid-state inverter and a rectifier/battery charger are housed in independent free-standing metal cabinets. The third section is a battery

plant sized to provide whatever reserve time a computer operation may need in the event of an ac power outage, the company said.

The Continac three-phase system features an automatic synchronous transfer circuit for solid-state, no-break transfer of the critical load. A remote alarm status panel monitors and reports power status constantly throughout the operation, alerting management to any and all power problems.

Lortec is located at 5214 Mills Industrial Pky., N. Ridgeville, Ohio 44035.

Panasonic Co.

NEW YORK — A variety of color and monochrome CRTs, plug-in modular power supplies and miniature

nonimpact printers will be unveiled by the Electronic Components Division of Panasonic Co. in Booth 2234.

In addition to its standard monochrome CRTs, Panasonic will feature its high-resolution CRTs with screen sizes between 1.5 in. and 13 in. Capable of displaying both alphanumeric and graphic data, these CRTs produce images comparable to color photographs in quality, the firm claimed.

A line of switching power supplies with efficiencies as high as 84% will be featured.

Three types of nonimpact column printers that can produce hard copy either thermally or on electrosensitive paper will also be shown. The "micro-printer" can print 15 char./line, the "standard printer" can print 15-, 21-, 32- or 40 char./line and the "5-in. printer" can print 20-, 40-, 60- or 80-char./line. All the printers handle alphanumeric data.

The firm is located at One Panasonic Way, Secaucus, N.J. 07094.

Hamilton Sorter Co., Inc.

NEW YORK — Stands designed to accommodate the special requirements of continuous form printers will be on display in the Hamilton Sorter Co., Inc. Booths 4060 and 4062.

The units are available in four sizes and three finishes. An under-table shelf provides for convenient feeding of continuous forms. Paper can be fed through the gap in the back panel, or an optional slot can be located anywhere on the top surface, the firm said. An optional read-adjustable forms shelf allows access to finished work.

The firm is located at 3158 Production Drive, Fairfield, Ohio 45014.

"We just introduced a new concept in DEC® disk subsystems. It's called competition."

Jim Toreson, President

There's nothing like competition to drive down data processing costs. And that's exactly what our new MSC 05/06 does for users of DEC's MASSBUS® minicomputers (Series 10 or 20, PDP®-11, PDP-11/70 and VAX®-11/780). Now you can save up to \$9000 each when you specify our disk drive subsystems instead of DEC's.

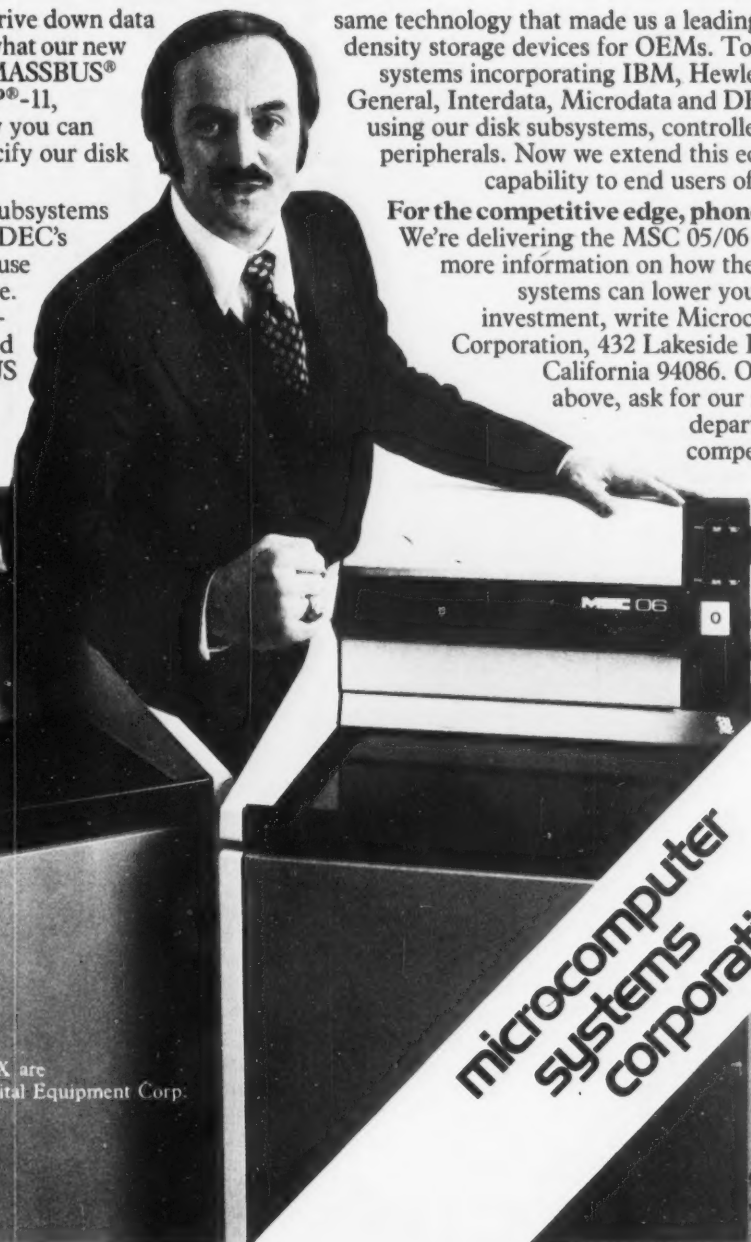
RP 05/06 Replacement. Our disk subsystems perform the identical functions that DEC's RP 05/06 subsystems do. In fact, both use the same industry standard disk drive. And the MSC 05/06 is the only non-DEC sub-system totally hardware and software compatible with all MASSBUS computers. Yet the MSC 05/06 costs up to 25% less than the RP 05/06.

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same technology that made us a leading supplier of high density storage devices for OEMs. Today, thousands of systems incorporating IBM, Hewlett-Packard, Data General, Interdata, Microdata and DEC equipment are using our disk subsystems, controllers and intelligent peripherals. Now we extend this economical storage capability to end users of DEC minis, too.

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We're delivering the MSC 05/06 immediately. For more information on how these advanced subsystems can lower your data processing investment, write Microcomputer Systems Corporation, 432 Lakeside Drive, Sunnyvale, California 94086. Or call the number above, ask for our customer support department and get the competitive edge today.



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... And Other Things to See

BDT Co.

NEW YORK — BDT Co. of West Germany will be featuring a forms tractor, front forms feeder and automatic sheet feeder in Booths 3206, 3208 and 3210.

The Model FT210 forms tractor was designed for Diablo Systems, Inc. or Qume Corp. printers. It features bidirectional double-sided tractor operation, adjustable paper tension control, disengagement clutch and clip-on installation. The tractor lids lock in place so the paper cannot fall out of the

lower tractor side. The unit operates with forms up to 14-in. wide and can be used singly or in conjunction with the Model FF110 front forms feeder. The FT210 costs \$230.

The FF110 front forms feeder for Diablo and Digital Equipment Corp. printers and terminals features manual forms insertion with subsequent control by, and in synchronizaton with, the printer drive mechanism. It operates with single sheets or multipart

forms, can be used singly or in conjunction with the Model FT210 and costs \$650.

Sheet Feeder

The automatic sheet feeder for character printers allows unattended operation of word processing systems. Units are available in single-sheet and dual-sheet models to provide for automatic selection of paper type.

All units can be installed on Qume

and Diablo printers and feature removable paper feed trays, manual paper insertion chute and the ability to handle multipart form sets.

The ASF 160 single sheet feeder costs \$1,410 and the ASF 170 dual feeder, \$1,710.

The products are manufactured by BDT in West Germany and are available in North America from MQI Computer Products, 18381 Bandilier Circle, Fountain Valley, Calif. 92708.

Data I/O Corp.

NEW YORK — Data I/O Corp. will exhibit its MOS Gang Programming Module for the System 17 and System 19 programmable read-only memory (Prom) programmers in Booths 1530 and 1532.

The module consists of a programming pack and socket adapter characterizers. The module allows programming of one to eight erasable Proms in parallel, the company said.

The design of the module allows for expansion to program 28-pin devices simply by exchanging appropriate socket adapters, Data I/O said.

Programming capabilities of the module, configured with a 24-pin socket adapter and seven characterizers, extend to all 2704, 2708, 2716 (both 1V and 3V), 2732, 2758, 2508, 2516 and 2532 devices.

The gang module is priced at \$1,400, including programming pack and gang socket adapter. Individual characters are \$75.

Data I/O can be reached through P.O. Box 308, 1297 N.W. Mall, Issaquah, Wash. 98027.

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Omnitec's new 9202BOD Automatic Answer Modem features a built-in key pad for rotary or touch-tone line dialing, number memory for re-dialing, speaker and volume control for line monitoring during call progress, FCC-approved DAA for direct connection to the switched telephone network plus compatibility with the Bell system 202 series. Single unit end-user prices start at \$671.25.

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... And Other Things to See

Mag-Tek, Inc.

NEW YORK — Mag-Tek, Inc. will highlight its exhibit in Booths 2034 and 2036 with the introduction of two products: the MT-50 manually operated encoder/verifier and the Medes 5000, a system for reducing the cost and time of hospital admission information processing.

The MT-50 encodes credit and ID cards, passbooks and documents of varying widths and lengths. It can be used in access control application such

as parking lots and industrial and commercial facilities and for employee identification cards and credit cards, Mag-Tek said.

The MT-50 is also compatible with various IBM systems and comes in three versions for different user applications. One pass of a card through the unit automatically codes and verifies it.

Standard features include visual display of previously encoded data for

verification, a 16-key hexadecimal keypad and some limited editing capability.

The unit ranges in price from \$1,450 to \$2,850 depending on model and configuration.

Patient Identification

The Medes 5000 is the first of the company's products for patient identification and information processing. Cards for the system reportedly pro-

vide sufficient card data to automatically print entry and insurance forms and other medical records.

It includes an electronic keyboard for

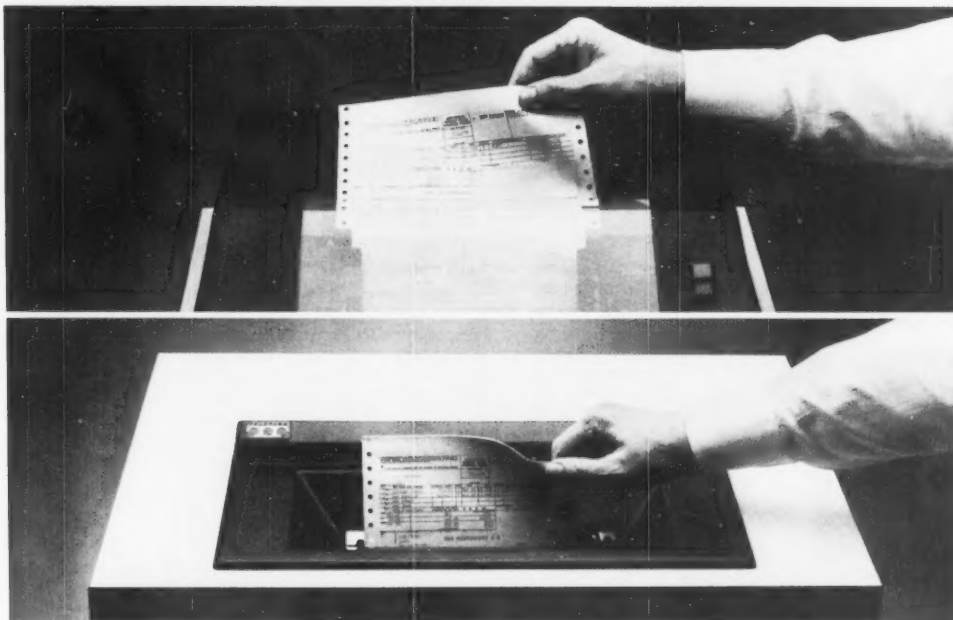


Mag-Tek's MT-50

data modification, a CRT to view changes and a high-speed printer.

The company will also show an access control door release and the MT210 magnetic stripe card reader with RS-232 interface. Mag-Tek is located at 20705 S. Annalee, Carson, Calif. 90746.

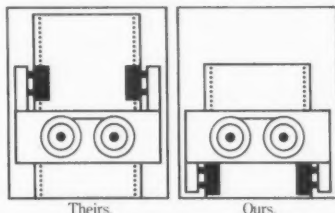
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If your company doesn't use the Teletype® model 40 Forms Access printer for orders, labels, invoices, billings, tickets, or any "on demand" printing, then it's likely you're wasting paper.

And wasting paper is wasting money. Especially when you're printing those expensive multi-part forms.

But the model 40 has a unique paper feed mechanism, so it saves paper. And money.



On conventional printers, the paper feed mechanism pulls the form through the printer from above. That means, to get at the form that's just been printed, you have to feed it out past the feed mechanism. And along with it comes the next form.

When you need the printed form right away, that can mean wasting every other form.

But the Teletype model 40 works differently. The paper feed mechanism is mounted below the printer, so the paper is pushed into the printer from below. You can print from the very top to the very bottom of the form, tear it off, and never waste or destroy the next form.

You can print anything from a single label to a multi-part invoice on the model 40, at 300 LPM. On forms ranging from 4¼" to 9" wide and from 2½" to 22" long. And the copy is always clean and sharp even on the last carbon.

Call Teletype Corporation for more information on the remarkable model 40 Forms Access printer. The sooner you stop wasting paper, the sooner you start saving money.



Teletype Corporation
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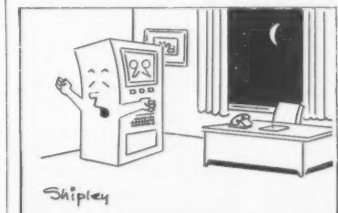
Multiwire New York

NEW YORK — Multiwire New York will show samples of its circuit boards in Booth 353.

The company services manufacturing firms in communications, DP, industrial instrumentation and military markets with multiwire boards.

The system uses a library of 35 software programs to construct board geometries, wiring lists and hole data as well as perform wire interconnection and editing functions. The programs also produce N/C tooling required for fabrication processes from a common base, the company claimed.

Multiwire is headquartered at 31 Sea Cliff Ave., Glen Cove, N.Y. 11542.



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... And Other Things to See

Vector Graphic, Inc.

NEW YORK — Ten word and data processing products from Vector Graphic, Inc. will be unveiled in Booths 340, 341 and 342.

- Matrix printer. This is a parallel-interface, 80-column, bidirectional dot matrix printer with a modifiable character set in a noise-reducing case. The unit is operational

on the Vector Graphic MZ or Memorite systems.

- 12K programmable read-only memory (Prom)/random-access memory (RAM) board. The S-100-compatible board is a Prom programmer as well as combination Prom/RAM board, the company said. It accommodates up to 12K bytes of 2708- or 2704-type

Prom and offers 1K of on-board RAM. Prom and RAM addresses are controlled by jumper options. The board sells for less than \$200.

- TV digitizer. This S-100-compatible fast-scan TV digitizer converts output from standard TV cameras into 8-bit gray-scale digital information. The digitized data is then transferred via software to RAM memory. Purchase of the high-resolution board includes a driver program. With this software and the high-resolution board, vertical resolution is 120, horizontal resolution is 128 and gray-scale resolution is 16 shades. The price is about \$150.

- Bitstreamer II I/O board. This I/O board is S-100-bus-compatible and reportedly interfaces with most terminals, printers, readers and punches. It uses 8251A programmable Usarts which can be software-configured for five to eight data bits and one, 1-1/2 or two stop bits. The board provides three serial I/O ports interfaced at RS-232 levels and 20 mA current loop plus two parallel I/O ports. By jumper option, the unit, which costs \$235, can generate interrupt requests.

- Mindless terminal. Designed for small business systems, this terminal accepts separate TTL video and synchronous and interfaces with most alphanumeric CRT boards. A 12-in. screen has 900-line resolution at center and 750-line resolution at borders. The unit has a custom 60-key typewriter format with 12-key numeric pad and special-function, directional and control keys as well. The terminal incorporates capacitance key switches and LSI N-channel MOS encoding electronics and sells for \$625.

- Flashwriter II video board. This high-density version of the Flashwriter displays 80 characters by 24 lines and features a 8-by-10-dot character matrix. Reverse video is optionally controlled by a high-order bit of the character code. Up to 256 characters can be generated by 2708/2716 erasable Proms which can be user-programmed for special symbols or graphic characters. The unit features 1,920 displayed characters serially mapped into a 2048-byte memory block, and its price is \$320.

- 48K memory board. This dynamic memory board provides 49,152 8-bit bytes of RAM using 24 16K chips. The unit can be used in any S-100



Vector Graphic Small Business System

bus system using a Z80 CPU board, the company said, although minor modifications may be necessary. It occupies the lower 48K of memory, beginning at 0000H. Price of the unit is \$695.

- Disk storage system. The Micro-Stor disk system was designed to interface with the Vector Graphic disk controller board and comes with two Micropolis MOD II disk drives. Each floppy disk has storage capacity of 311K bytes formatted with 16 hard sectors and 77 tracks. The system operates with both static and dynamic memories at a data rate of 250K bit/sec, the unit requires 115 Vac power and includes controller board, disk operating system, compiler, Z80 assembler, editor and debugger. The price is \$1,395.

- Z80 microcomputer. The Vector Graphic MZ reportedly

has four times the disk storage capacity of most other micros with built-in floppies. Capacities are 630K bytes formatted and 48K bytes of RAM. The mainframe bus is S-100 compatible, and the CPU is a Mos-tek Z80A with eight data bits and 16 address bits. The unit is priced at \$4,750.

- Word processor. The Memorite II offers word processing in addition to the DP operating systems. Its word processing software is stored on 8K of Prom in a memory area not needed for DP. This is a turnkey system that includes a CRT console (with typewriter keyboard, 10-key numeric pad and screen), two magnetic disk drives and high-speed bidirectional daisywheel printer. Price of the system is \$8,900.

Vector Graphic is located at 31364 Via Colinas, Westlake Village, Calif. 91361.

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International Data Corp.

NEW YORK — International Data Corp. (IDC) will exhibit tidbits from its data bases, samples of its information services and copies of newsletters in Booths 2601 and 2603.

Its data bases include the Worldwide Computer Installation Data File, Worldwide OEM/Systems House Prospect Data File, Services and Software Data File and the Package Software Buyers Directory.

Files are available by geographic region, manufacturer, model and industry, with custom selections available upon request.

As for information services, IDC offers a Corporate Planning Service, Information

Systems Planning Service, Automated Business Communications Programs, Services and Software Information Program, Computer Output Program and the Computer Industry Planning Service.

These services include research reports, unlimited telephone inquiry, personal contact, newsletters, seminars and conferences.

The firm's newsletters include *EDP Industry Report*, *Autotransaction Industry Report*, *EDP Japan Report*, *Distributed Processing Reporting Service*, *Datacomm Advisor* and *Europa Report*.

IDC's corporate headquarters are at 214 Third Ave., Waltham, Mass. 02154.

... And Other Things to See

BASF Systems



Circuit Assembly Corp.

NEW YORK — Circuit Assembly Corp. in Booth 1028, will demonstrate its Dip-Lock fasteners and polarized interconnects that are said to minimize vibration or strain on cables because of pulling or accidental jostling and to eliminate misconnections during assembly.

The Dip-Lock fasteners have a spring action that causes the device to lock into the recesses at the end of the plug's socket. This not only ensures a secure fit between the plug and the socket, but also provides a neat appearance on the board.

The firm's polarized interconnects feature an offset guide that mates with a keyed plug insulator and are offered in a variety of conductor types including flat or twisted pair styles. Special configurations are also available to meet consumer requirements, a spokesman added.

Double-ended, 12-in.-long Dip-Locks cost approximately \$2.25 each in lots of 1,000 from the company at 3169 Redhill Ave., Costa Mesa, Calif. 92626.

Computrend, Inc.

NEW YORK — A plethora of products from a multitude of manufacturers will be featured at Booths 4623 and 4625, where Computrend, Inc., a distributor, will display the wares of 12 companies.

The company will demonstrate printers from Teletype Corp. including the venerable Model 33 keyboard send/-receive and automatic send/receive; the LA34, LA36 and LA180 printers from Digital Equipment Corp.; and printers from Texas Instruments, Inc., Diablo Systems, Inc. and Printronix, Inc.

In addition, a floppy disk system from Sykes Datatronics, Inc., data cassettes from Techtran Industries, Inc. and acoustic couplers from Multitech Systems and Anderson-Jacobson, Inc. will be shown.

Terminal stands and other accessories from Maine Manufacturing, a tape punch and reader from Data Specialties, Inc. and an Infoton CRT will be on display.

Computrend, Inc. is located at 22 "A" St., Burlington, Mass. 01803.

NEW YORK — BASF Systems, in Booth 4630, will feature production models of its 6106 (single-sided) and 6108 (double-sided) 5-1/4 in. floppy disk drives and media.

The company will be showing its line of 8-in. and 14-in. rigid disk media including its plated disk, with a capacity of about 210M bytes; its 650 disk, suitable for double-density 3350 applications; and the BASF 3350 disk, for use in single-density 3350-type drives.

Also on display will be BASF's disk pack line including the T-300, for use on California Computer Products, Inc. T-300 and compatible drives; the BASF Control Data Corp.-compatible storage modules, available with either 40M- or 80M-byte capacity; and its line of single-disk cartridges with 10M- to 40M-byte capacity.

Flexydisks will also be shown, including a two-sided double-density version of the Model 2 diskette, intended for use on the IBM System/34 and other compatible systems. The Model 2N, a two-sided flip-over version of the Model 1, will be shown, as well as an 8-in. Flexydisk custom-tailored to operate on 32-sector, outside-diameter drives used in word processing systems.

In addition, BASF will show three models of its 5-1/4-in. Flexydisks. BASF is located at Crosby Drive, Bedford, Mass. 01730.

Getting what you pay for — the hard facts about systems software.

Fact or myth? Increased capability means increased cost. Find out the truth in our June 25th supplement: *Systems & Utility Software*. Edited by Don Leavitt, this special report will give you important information ranging from the gross statistical to interviews with specific users about why they chose particular packages.

In the area of operating and utility software systems some of the topics we'll be taking a close look at are:

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If you're an MIS executive, DP Manager, Supervisor or Programmer, you'll find our June 25th report especially valuable. If you market systems or utility software — your ad should be there. Closing date is June 8th. To reserve space, call Melinda Walker or Miriam Gaylin at (617) 965-5800.



COMPUTERWORLD

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... And Other Things to See

Philips Test and Measuring Instruments, Inc.

NEW YORK — Philips Test and Measuring Instruments, Inc. will demonstrate a number of recently introduced instruments in Booth 3042.

Among the test units to be shown is the PM3500 logic analyzer and its companion PM3540 scope. The 16-channel, 100 MHz logic analyzer and logic scope combine oscilloscope timing capabilities with an integral logic state analyzer, the firm said.

Internal, external and manual triggering facilities are provided. Sampling can either be at the internal crystal-controlled variable rate of 10 nsec to 20 msec, or at the clock rate of the circuit under test. A "glitch" catching mode allows detection of and triggering on spikes and transients as short as 3 nsec, the company said.

The PM3500 logic analyzer will cost \$8,295, while the PM3540 will sell for \$3,975.

Philips will also display a dual-trace 100 MHz storage oscilloscope with writing

speeds up to 1,000 div/msec. The PM3266 uses a specially developed high-speed transfer

speed varies from 15 seconds to one hour, depending on intensity, and can show an alter-

onstrate a microprocessor-controlled 100 MHz oscilloscope that reportedly can combine delay time or by event, eliminating jitter in solving problems of event identification.

The dual-trace scope, called the PM3263, is portable and provides dual delayed sweeps for accurate time measurements with digital readouts. Its microprocessor readout allows direct readout of time and frequency.

Power consumption on the \$3,500 unit is quoted at 55 W.

A less expensive scope known as the PM 3207, featuring an 8 cm by 10 cm screen, features automatic triggering with automatic level setting depending on the peak-to-peak value of the input signal. It is adjustable between 5% and 95% of signal amplitude and has a separate manual trigger control, the company indicated.

Weighing in at 8.8 lb, the PM 3207 will be priced at \$795.

A Philips isolation amplifier, the PM 8940, that safely measures small floating signals on high voltages will also be shown.

While it is primarily intended for use with oscilloscopes, it is suitable for opera-

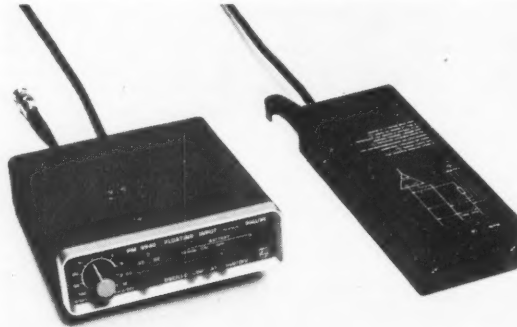
tion with counters, distortion meters, waveform analyzers and logic analyzers, the vendor noted. The unit boasts a high common mode rejection rate of 1:800,000 in the 5 mV division setting and it is said to permit highly accurate observation of minute details in complex waveforms.

It is comprised of two units — a preamp, or probe, and a separate control box containing an attenuator/amplifier.

The high-voltage cable used to interconnect the sub units can withstand temperatures to 250° C. Disconnection of the two units requires a screwdriver, alerting the user to remove the high-voltage source before proceeding any further. Cost is \$975.

A pair of microprocessor-based smart counters, the PM 6667 and PM 6668, are said to give high accuracy and reliability because of the use of large-scale CMOS circuitry and fully integrated front ends that handle a wide range of input signal voltages.

Self-diagnostic capabilities are built into the microprocessor to perform functional block tests at every power on, Philips stated. The company is located at 85 McKee Drive, Mahwah, N.J. 07430.



The Philips PM 8940

storage CRT with scan magnifications in the vertical direction enabling it to provide high writing speeds over the whole screen, Philips explained.

Storage time at maximum

nate display of main and delayed sweeps. The unit is specified at a 5 mV sensitivity and a trigger bandwidth up to 200 MHz. It will be priced at \$5,245.

The company will also dem-

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Applied Data Communications

NEW YORK — Applied Data Communications (ADC) will debut its high-speed Floppy Copy IC-450 programmable media system for testing, initializing and multiple copying both standard and mini diskettes in Booth 356.

The IC-450 features an automatic stacker/loader that holds up to 50 diskettes for progressive feeding one at a time.

The system is compatible with ADC's T-400 floppy disk test system and handles all IBM and most other industry standard and nonstandard formats, single- or double-density and one- or two-sided floppy drives, the company said.

Modes include FM for single density and MFM or M²FM for double density; both hard- and soft-sectored techniques can be accommodated.

The IC-450 handles both maxi and mini diskettes and converts from one to the other without further processing, ADC said.

The IC-450 is available as a

complete operating system, fully equipped with CPU, stacker/loader, CRT console and workstation desk. Maxi, mini and maxi/mini combinations of the IC-450 are available.

An interface for adding an optional Centronics Data Computer Corp. serial printer (60- to 120-char./sec.) is included. An optional interface can accommodate the Teletype Corp. Model 40 line printer. Price for the maxi or mini only is \$19,950; both cost \$29,500.

ADC is located at 14272 Chambers Road, Tustin, Calif. 92680.



'We Seem to Have a Little Problem Somewhere.'

... And Other Things to See

Spatial Data Systems

NEW YORK — Highlighting Spatial Data Systems' Booth 4036 will be a self-contained, microprocessor-based picture digitizer and display designed for picture analysis, remote sensing and industrial inspection applications.

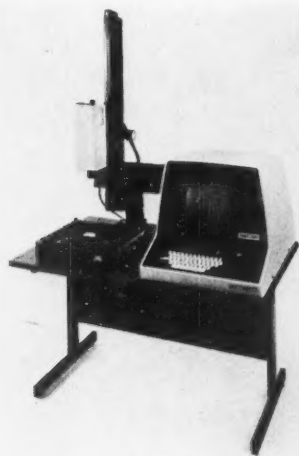
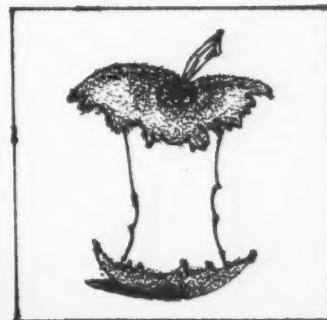
The Eyecom II is an upgrade of the

firm's original Eyecom unit and incorporates expanded image-processing software, an alphanumeric terminal and a joystick cursor. The unit's picture digitizer is a 640-by-480-resolution device with 8-bit digitization in less than three seconds, a spokesman claimed. The Eyecom's picture display boasts the same resolution with an 8-bit grey-scale and a white graphics overlay.

The unit's alphanumeric display can

accommodate 24 lines of 80 characters, all 128 Ascii upper and lower case, and has a hardware page erase function. The Eyecom's keyboard is full typewriter-style for four-level Ascii codes, with 256 codes in all. Finally, the built-in microprocessor is a 16-bit LSI-11 model with 32K bytes of random-access memory.

Spatial Data Systems can be reached through Box 249, 508 S. Fairview, Goleta, Calif. 93017.



The Eyecom II

Cherry Electrical Products Corp.

NEW YORK — Cherry Electrical Products Corp. will exhibit its products in Booths 1022 and 1024. The firm will introduce its solid-state keyboards, the CB80-07AA and the CB80-12AA, secretarial and communications styles.

These keyboards feature low-profile capacitive keys with no contacts. The reliable method of switching found in these keyboards is made possible by the development of a keyboard encoder which requires only a +5 Vdc supply, the firm said. In addition, the device has an encoding capability of up to 10 bits for 110 keys and four modes per key.

Codes were designed using a low-cost mask option and any code can be selected including Ascii, Usascii, Baudot or Ebcidic.

Scan time is adjustable from 10 microsec to 80 microsec per key. Burst rate speed capability is 1,000 char./sec, the firm noted.

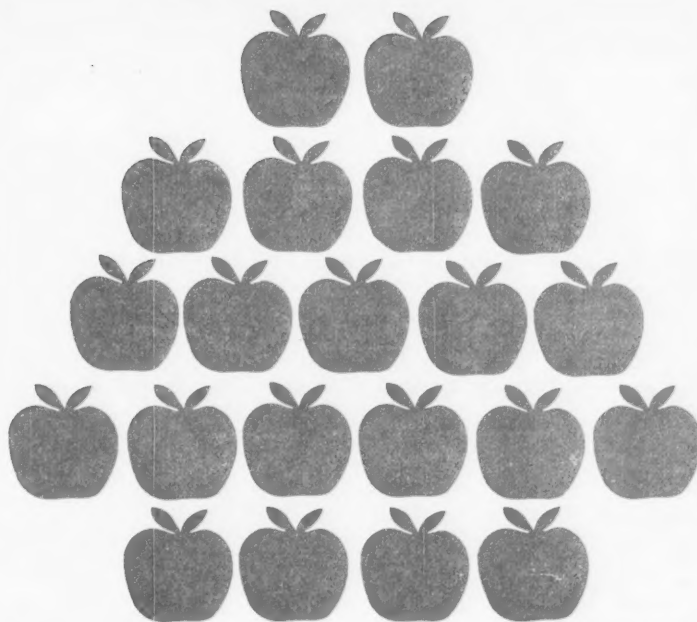
Life expectancy for the keyboards is expected to exceed 300 million operations, the company said, adding that prices will be competitive with keyboards featuring mechanical contacts.

Optional features include lockout of the code and strobe for a second key until the first key is released and a repeat option for all, some or none of the keys, with a delay of up to 4.5 sec before starting a repeat.

Cherry is located at 3600 Sunset Ave., Weaukegan, Ill. 60085.

NCC BOOTH 1506

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3. BULK SEMI RF-11 compatible disk emulation system for PDP-11
4. 128K x 18 semi ADD-IN with on-board parity for PDP-11
5. Dual port for PDP-11 BULK CORE disk emulation system
6. Dual port for PDP-11 BULK SEMI disk emulation system
7. 128K x 18 semi ADD-IN for LSI-11/23
8. BULK SEMI RF-11 compatible disk emulation system for LSI-11
9. RJS03-compatible BULK CORE disk emulation system
10. LSI-11 based BULK MINI using BULK SEMI
11. BULK SEMI main memory ADD-IN for PDP-11/70

12. 256KB semi ADD-IN for DECOSYSTEM 2020
13. 256KB semi ADD-IN for Nova 3
14. 256KB semi ADD-IN for Eclipse
15. ADS and RDOOS-compatible BULK CORE disk emulation system for Nova and Eclipse
16. BULK SEMI Novadisc-compatible disk emulation system for Nova and Eclipse
17. BULK SEMI ADS and RDOOS-compatible disk emulation system for Nova and Eclipse
18. Dual port for Data General-compatible BULK CORE disk emulation system
19. Dual port for Data General-compatible BULK SEMI disk emulation system
20. BULK SEMI interdata-compatible disk emulation system
21. Core ADD-IN for Univac (Varian) V77-400

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... And Other Things to See

Eichner Systems, Inc.

NEW YORK — Eichner Systems, Inc. will display its diskette and mini-diskette retention and retrieval systems in Booths 4026 and 4028.

Among the products on view will be:

- A floppy disk fan file for housing 10 diskettes that costs \$34 and a 20-diskette version

that lists for \$47.

- A floppy disk modular desk stand for housing 20 diskettes. The unit sells for \$86.50.

- A floppy disk rotary stand

with storage capacity for 50 to 200 diskettes, depending on the model selected. Prices vary by model.

- A mini-diskette, four-ring easel binder with a capacity of

five panels (20 mini-diskettes) that sells for \$10.70.

- A modular mini-diskette desk stand that holds 10 panels and lists for \$34.30.

- A mini-diskette rotary

stand with a capacity of 50 or 100 panels with varying prices.

Eichner Systems is located at 2220 Landmeier Road, Elk Grove Village, Ill. 60007.

Rusco Electronic Systems

NEW YORK — Rusco Electronic Systems (RES) will display its card-based management control Identification Network System with a typical configuration of micro-access controller, reader-terminals and printer or magnetic recorder output device in Booths 431 and 432.

The company will also display its maximum security access/data collection card reader for OEM use.

The security is provided by the firm's Ruscard, which is identical to a standard plastic credit card. Each card has a unique identification number encoded in a fully encapsulated memory core within the badge. The more than one trillion code combinations permit high security, the firm said.

The Identification Network System provides security when, after programming the micro-access controller, management can determine who has access to which areas or pieces of equipment and when.

To gain access to a protected area, an employee inserts the Ruscard in the card reader at the access point. The code is transmitted back to the controller, which either permits or denies access based on three separate categories of input: personal identification number, time code and status level, which indicates where the card holder can use his or her card to gain access. The controller comes in two models depending on the number of possible numbers that are needed.

The RES-manufactured security access/data collection reader accepts only magnetically encoded Ruscards and transmits the card data plus any data from an optional keyboard.

Rusco Electronic Systems is at 1840 Victory Blvd., Glendale, Calif. 91201.



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... And Other Things to See

Tab Products Co.

NEW YORK — Tab Products Co. will display its key-to-diskette family including the 701 single-station system, the 702 dual-station system, diskette-to-tape converter, the

Model 501 punch/verifier with communications and remote job entry (RJE) stations. Other displays in Booths 3601, 3603, 3605 and 3607 include office filing systems and

computer accessory products including data media cabinets, tape storage equipment and forms equipment including a decollator and miniburster, the company said.

Features of the Model 701 include operator prompting, a six-line CRT with a 40-char. line, auto program sequencing and index track cuing for label preparation. The unit costs

\$4,950 and can be leased for \$115/mo on a two-year basis.

The Model 702 adds disk copy capability and has two stations with 10 program levels per station and 84 stored constants, according to the manufacturer. Purchase price is \$1,675 more than that of the 701 and \$47 more a month on a two-year lease.

The Model 501 was designed for card-oriented applications, either as a stand-alone key-punch or a data communications terminal. It punches, prints interprets, verifies and corrects, and microprocessor logic and buffered memory are claimed to improve operator performance.

The 501 has eight program levels and 58 character constants and costs \$6,400. The two-year lease rate is \$143/mo.

Further information is available from Tab Products Co., 2690 Hanover St., Palo Alto, Calif. 94304.

PROBLEM:

WESTLAW is West Publishing Company's answer to a lawyer's plea.

It offers direct access to a vast electronic library—the tens of thousands of state and federal cases that West, a leading publisher of law books, have in their St. Paul computer files.

Research that once took hours now takes seconds.

Ironically, WESTLAW's far-reaching success posed a problem: could data communications keep pace with its rapid growth coast to coast?

Before adding full text printouts to the service, for example, West wanted to be sure that lines and terminals could handle the longer messages efficiently.

Also, they did not want the expected surge in demand to slow down their almost instant response to inquiries.

The problem was data communications. The solution came from the Bell System.



SOLUTION:

The case for the Bell System solution was made on the basis of astute total systems planning and two Bell innovations.

One is Dataphone® Digital Service. This is the high-performance digital network that already links the nation's largest cities. It has helped virtually eliminate errors and interruptions in WESTLAW transmissions. It's also helping keep response times ultrafast.

Second is Bell's newest Data-speed® terminal—keyboard, display unit, and high-speed printer—now used by WESTLAW subscribers.



Full text almost instantly, in print.

This new system plus Bell's continuing on-the-spot involvement have prompted West to look at still other ways to take full advantage of the Bell solution.

If you haven't talked communications systems with your problem-solving Bell Account Executive, you're missing something—in voice, data and network services.

The system is the solution.



Bell System

Van San Corp.

NEW YORK — Van San Corp. will present its Quietizer cabinet Model 1720 in Booth 1128.

This unit reduces the noise level of the Teletype Corp. Model 40 and OEM 80- and 132-column tractor/printers, the company said.

The 1720 features filtered ac wiring, on-line/off-line switch,



The 1720 Quietizer

mounts for EIA and SSI assembly plus heavy-gauge steel construction. The floor model steel outer shell was designed to place the teletype at operational height.

The 1720 at \$400, is the lowest priced noise-reduction cabinet in the Quietizer line. Other models range from \$405 to \$440.

Van San Corp. is located at 16735 E. Johnson Drive, City of Industry, Calif. 91745.

... And Other Things to See

Visitors From the British Isles

NEW YORK — A group of British companies will feature products including microcomputers, software, trade publications and a system that captures and validates handwritten data in Booths 4516 and 4416.

The Black Box, being shown

by Rair Ltd., is a general-purpose desktop system with dual minifloppy disk drives and multiple serial interfaces.

Quest Automation Ltd. will display its Datapad system, which captures and validates handwritten data at the time of writing. The writer reportedly uses an ordinary pen or pencil on tailor-made documents. Data capture will also

be demonstrated by Modular Technology Ltd.

Newbury Laboratories Ltd. will offer a range of CRT terminals based on the Model 7000 Series shown last year, while Lynwood Scientific Developments Ltd. will show three CRT units — the GD-APL terminal, the GD-4K CRT and the Alpha, which has a high-frequency televi-

sion design.

Interco Business Consultants Ltd. which provides international marketing services, will give display opportunities to two of its clients: Time Utilizing Business Systems Ltd. will introduce to the U.S. an interactive file management, data entry, inquiry and reporting system. Zeus-Hermes will explore U.S. marketing possi-

bilities for the firm's software.

Online Conferences Ltd. will distribute information on its technical conferences in the computer, information processing and communications sphere and will feature samples of its publications.

Management Systems and Programming Ltd. will display software products including the Datamanager, Testmanager and Project-manager aids to systems development. Also featuring software will be Al-tergo Software Ltd.

IPC Electrical-Electronic Press Ltd. will have a booth for each of two publications — *Computer Weekly*, a newspaper, and *Systems International*, a monthly magazine. *Computing*, a weekly newspaper dealing with all aspects of the computer world, will complete the British exhibits.

The British group is sponsored jointly by the Business Equipment Trade Association and the British Overseas Trade Board.

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TELEX: 642-071

Nortronics Co., Inc.

NEW YORK — Five magnetic recording heads for diversified applications will be displayed by Nortronics Co., Inc. in Booth 1110.

The company's half-inch Streamer heads were designed for disk-file backup memories. The .5-in. Streamers can store data from one IBM Model 3370 drive (570M bytes) on 1,500 ft of .5-in. magnetic tape at a data transfer rate of 1.86M byte/sec, the company said.

Model DQ-91 is a 9-channel, .25-in. head for low-cost storage in disk-file memories. The head records at 10,000 fci which, when used with group code recording, would provide a total capacity of 32M bytes when used with 3M Corp.'s

Model DC-300A cartridge, the company claims.

A single-sided ferrite read/write floppy disk head with "straddle" erase — Model FFD-B5-48 — is for use in flexible disk drives at rotational speeds up to 360 rpm using either a 5.25-in. or 8-in. diameter floppies. This head records a track which is nominally 0.0130 in. wide at a radial density of 48 track/in.

A single-sided ferrite read/write floppy disk head with "tunnel" erase — Model FFD-BT-100 — is for use in flexible disk drives at rotational speeds up to 360 rpm using .003-in. thick, 5.12-in. diameter floppies. The head records a track which is nominally .00625/in. wide at a radial

density of 100 track/in.

Model FFD-DST is a double-sided floppy disk head that doubles the recording capacity on a single flexible disk. The head is compatible with Ansi standards and extends the data capacity of a single disk, recorded on both sides, to 1M byte.

Nortronics is located at 8101 10th Ave. North, Minneapolis, Minn. 55427.

Hamilton/Avnet

NEW YORK — Hamilton/Avnet, a distributor of computer products and electronic components from a variety of manufacturers, will feature a sampling of its micro products and peripherals in Booths 3625 and 3627.

Among the displays, the company will show Centronics Data Computer Corp.'s Model 704 and Model 753 printers, Digital Equipment Corp.'s LSI-11/23 microcomputer, Fairchild Camera & Instrument Co.'s Mi-

croflame family and Hazeltine Corp.'s Model 1420 CRT.

In addition, Intel Corp.'s ISBC 86/12 single-board computer, Motorola's development systems and micromodules, Novation, Inc.'s CAT acoustic modem and Shugart Associate's 801R floppy and 400 minifloppy will be shown.

H/A stocks these products at each of its 36 locations nationwide and is headquartered at 10950 Washington Blvd., Culver City, Calif. 90230.



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... And Other Things to See

Pace, Inc.

NEW YORK — Pace, Inc. will exhibit its portable desoldering systems in Booth 438.

The Model PC-10 is self-contained, weighs less than 6 lb and removes components from circuit boards.

The Model PC-10 uses an internal vacuum source rather than electrical actuation, so the unit is spike-free and safe for use with MOS and bipolar-type components, the company said.

The system is activated by a finger control on the Sodr-X-Tractor handpiece. By sliding a finger over an orifice, the operator generates instant vacuum which removes the solder joint on a circuit board and frees the component lead.

Another control sets the temperature of the desoldering tip to facilitate rapid solder melt. The system's Thermo-Drive heat control assures that no damage or lifting of the pad occurs and that the component lead does not resweat to the plated-through hole, the vendor said.

The PC-10 comes with power source, handpiece, integral cubby for folding and storing the handpiece, cleaning brushes and a supply of spare desoldering tips. The single-unit price is \$325.

Pace, Inc. is located at 9329 Fraser St., Silver Spring, Md. 20910.

Continental Instruments

NEW YORK — Continental Instruments Corp. will exhibit its line of electronic access control systems in Booth 4224.

The Cypher Lock electronic combination lock uses a 10-button panel mounted near the door outside the protected area. A 4-digit combination, pressed in the correct sequence, will unlock the door for a predetermined period. A holdup alarm sounds if entry is forced, and an optional error alarm will sound if incorrect entry is made on the pushbutton panel. Weather-proof equipment and decorator styles are available. The price is \$360.

The Code 'N Card permits access via three operating

modes: memorized code only; magnetically encoded card only; and code and card. The unit uses magnetically-encoded cards with custom printing or photo ID. The unit can be programmed for lock-out and time zoning, the company said, and sells for \$690.

The Key Code line permits use of a different code for each person. Every individual has a 4-digit code and matching encoded key. The key can be encoded with 28 bits of parallel information which will yield more than 600 million possible combinations.

Access is gained by first inserting the key into the key code reader and then entering a memorized code on the keyboard. If the combination en-

tered matches the key, entry is permitted. The price is \$1,695.

Continental Instruments is located at 170 Lauman Lane, Hicksville, N.Y. 11801.

Computer Science Press, Inc.

NEW YORK — A collection of text and reference books in computer science, engineering and chess from Computer Science Press, Inc. will be displayed in Booth 4006.

Browsers will have a chance to review several titles including: *Pascal: An Introduction to Methodical Programming*, by W. Findlay and D.A. Watt; *Foundations of Computer Science*, by Carberry, Khalil, Leathrum and Levy; and *Assemblers, Compilers and Program Translation*, by P. Calingaert.

Representatives will discuss the Computer Science Press education extension program which will cover subjects such as Pascal; data base systems design; structured basic and computer architecture.

CSP is headquartered at 9125 Fall River Lane, Pottomac, Md. 20854.

Magnusonic Devices, Inc.

NEW YORK — In Booth 2520, Magnusonic Devices, Inc. will show its line of magnetic tape and disk heads, cassette and cartridge heads and a number of special application read/write and erase heads.

The 2314-type magnetic read/write disk heads operate with disk pack, disk cartridge or fixed-disk drives and are provided in single-density, double-density and quadruple-density models. The single-density versions have a track density of 100 track/in. while the double and quadruple models have densities of 200 track/in.

In addition, the 2314 was designed for single-density and double-density 1,500- and 2,400 rev/min, while the A2200 quadruple series runs at 2,400 rev/min.

Two Versions

The 3330-11 type and 3330-type read/write disk heads are available in both single- and double-density versions with track densities of 192- and 370 track/in. The heads' bit density is 4,400 bit/in. and the devices function at disk speeds up to 3,600 rev/min.

The firm will also be demon-

strating its 9-track, dual-gap, read/write and erase head tape assemblies geared for small computers and data communications systems. The Model 219-9 assemblies, designed for NRZI types of recording, have a packing density up to 800 bit/in. and a speed range up to 45 in./sec.

The 219-9 is also available in a dual-density model with phase encoding as well as NRZI types of recording, the

spokesman stated.

Finally, Magnusonic will spotlight a 9-track, dual-gap read/write and erase head for Ansi-compatible tapes that operates at speeds up to 125 in./sec, has a useful life up to 10,000 hours and functions in either an NRZI or 6,250 bit/in. group code recording format.

Magnusonic Devices is headquartered at 290 Duffy Ave., Hicksville, N.Y. 11801.

Computer-Link Corp.

NEW YORK — Computer-Link Corp. will take advantage of Booths 3500 and 3502 to display its Series 2000 magnetic tape evaluator/cleaner, its Model 1011 tape cleaner/rewinder and its Model 670 disk cartridge cleaner/inspector.

The Series 2000 cleans each tape twice before testing using two gemstone cleaning blades and two constant-speed tissue wiping stations. In addition, the unit evaluates serious tape defects and can be used to determine how much computer time will be wasted by individual tapes, the firm said.

Preventive Measure

Furthermore, the marginal error detector locates tape programs that are not yet serious enough to cause write skip dropouts and counts and prints out the number of these potential error locations.

The unit handles 1/2-in. to 10-1/2-in. reels with IBM quick-release-type hubs and has adjustable tape tension in order to match the particular computer drive tension used by a shop.

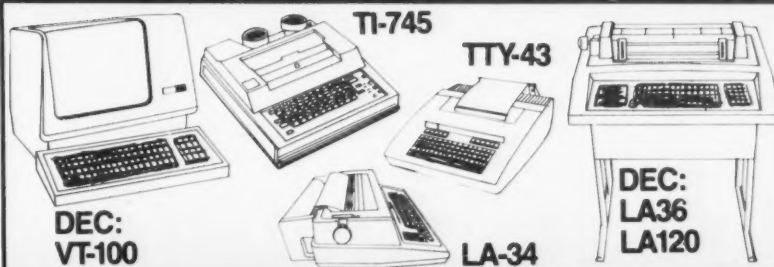
The Model 1011 also uses two-cycle cleaning with separate blades for forward and return pass cleaning.

Runout Gauge

The Model 607 can be used to clean both front-loading and top-loading cartridges and features an axial runout gauge for protecting against head crashes. The unit uses a precision pump and filtered fluid metering system to control the amount of cleaning solvent used, thereby reducing the problem of streaking, the firm claimed.

Computer Link is at 14 Cambridge St., Burlington, Mass. 01803.

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Low Cost/Feature Enhancements

MICRO BEE/MODEL DM10 \$995

The DM10 is an 8085A microprocessor controlled terminal offering numerous user oriented features, including a line drawing capability to allow creation of graphic displays. The 25th status line is used extensively by the DM10 system firmware to display modes of operation, error messages, communication protocol data and a time-of-day clock as well as a status message showing optional switch configurations.

Flexible Applications Oriented

MICRO BEE/MODEL DM1S \$1345

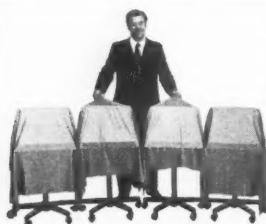
The DM1S is a completely programmable terminal featuring a new design concept of socketed flexibility. The needs of virtually any application can be met with custom generated software or software purchased from Beehive. Emulation packages include DEC VT52*, Microdata Prism*, Data General Dasher*, ADDS Regent 100* and Beehive's DM1A*.

*These names may be subject to trademark claims

Expanded Function Capabilities

MICRO BEE/MODEL DM1A \$1395

The DM1A expands Beehive's product line conversation capability by allowing bidirectional, fully buffered communications to an auxiliary device. Communications between the CPU and the auxiliary peripheral device can be transparent to the terminal. Features include non-displayable character attributes enabling selection of seven video levels, a line drawing capability and the ability to enter or receive data in the unlocked portion of the display.



*Mr. Duke DeForest,
Vice President
of Sales for Beehive,
invites you to see the entire
Micro Bee product line
with new detachable
keyboard styling at the
NCC . . . Booth 2135*

Editing

MICRO BEE/MODEL DM20 \$1695

Beehive's DM20 is a buffered terminal designed to address both interactive and batch mode markets. Standard features include bidirectional serial auxiliary port, fixed tabs, clear entry function, descenders on lower case characters, invisible cursor, CPU message deposit, line monitor mode, CPU line lock and transparent printing. An invisible memory address pointer, sixteen function keys and system mode/control keys are very positive enhancements.

BEEHIVE'S NEWEST!

Multi-Page/Editing

MICRO BEE/MODEL DM30 \$1995

In addition to incorporating all DM20 features, Beehive's new DM30 provides two pages of display memory, an auxiliary serial interface, and an optional parallel interface. Next page and previous page key lets the user select page boundaries while Scroll Up and Scroll Down permits the user to go across page boundaries in scanning text and editing.

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Dining Out in the Big Apple

(Continued from Preview/7)

David K's, 1115 Third Ave. at 65 St., 371-9090. Fashionable, but expensive. Famous for its Mongolian hot pot, which is a Chinese fondue at \$35 per person (for eight). Reservations in advance.

Uncle Tai's Hunan Yuan, 1059 Third Ave. near 62 St., 838-0850. "Soothingly consistent, even at lunch," says Greene.

Hunam, 845 Second Ave. at 45 St., 687-7471. Home of the hot sauce Olympics.

Pearl's, 38W. 48St., 586-1060. The place that brought Cantonese food uptown. Best eggs with hot sauce in town.

Chinese In Chinatown

Tung Sing, 6 E. Broadway, 966-0510. Chinese menu is on the wall. Ask for translation. Best salty fried squid.

Hee Seung Fung, 46 Bowery, 374-1319. "When it is good, Hee Seung Fung is very, very good, but at dinner the throngs thin to a trickle, and once in a while the kitchen can be erratic," reports Greene. Best dim sum.

Canton, 45 Division St., 226-9173. Favorite of architect I.M. Pei. Kitchen is eager to please. Best duck liver and pork sausage with steamed Chinese broccoli.

Hop Shing, 9 Chatham Sq. 267-0220. No credit cards. Good place to try unusual chicken, clams, beef and oysters.

Hoolok Corporation, 54 E. Broadway, 226-0969. No credit cards. A "shabby storefront haven of Shanghai home cooking," often full of happy diners.

Best Morsels Uptown

Adam's Rib, 23 E. 74 St. between Madison and Fifth Ave., 535-2112. American cuisine in subdued English dining room.

At Our Place, 2527 Broadway at 94th St. Middle Eastern and vegetarian specialties served in multileveled, mirrored room. Friendly and informal.

Cafe San Martin, 1458 First Ave. at 76th St., 288-0470. Continental cuisine in imaginatively stylish restaurant with skylights.

Chateau Henri IV, 37 E. 64 St. between Madison and Park Aves., 757-8818. Fine continental and French cuisine in romantic, castle-like room. After-theater menu.

Daly's Dandelion, 200 E. 61 St., 838-0780. Former speakeasy, now with American food and old New York charm.

Friday's, 1152 First Ave., corner 63 St., 832-8512. Where singles still gather for food and spirits. After-theater menu.

Il Vagabondo, 351 E. 62 St., 832-9221. Fun restaurant with good food alongside a bocci court. Menu recited by waiters.

Kleine Konditorei, 234 E. 86 St. between Second and Third Aves., 737-7130. Famous German restaurant in the heart of old German neighbor-

hood.

La Cocotte, 147 E. 60 St. between Lexington and Third Aves., 832-8972. French cuisine in elegant dining room.

La Folie, 21 E. 61 St., 765-1400. "The restaurant is like a jewel box, every inch precious," according to one reviewer. French cuisine.

La Petite Ferme, 973 Lexington Ave. between 70 and 71 Sts., 249-3272. French farmhouse ambience with outdoor garden for drinks and French food.

Le Coup de Fusil, 160 E. 64 St., 751-9110. Featuring "la nouvelle cuisine," a light French food with emphasis on the quality of each ingredient, beauty and taste of each dish. Limited

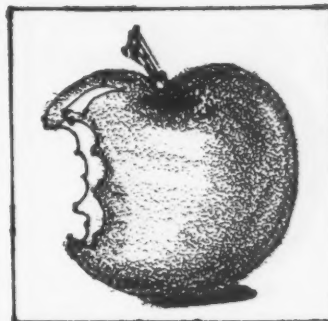
menu varies monthly.

Le Lavandou, 134 E. 61 St. between Lexington and Park Aves., 838-7987. Beautiful French restaurant with good food and pleasing service.

Le Refuge, 309 E. 83 St., 861-4505. Charming French Provincial restaurant with daily menu changes and wine list. Reservations required. No credit cards.

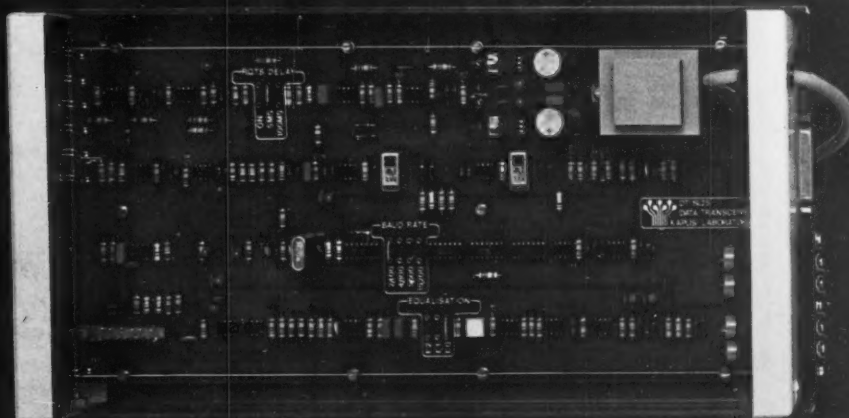
Le Veau d'Or, 129 E. 60 St. between Lexington and Park Aves., 838-8133. French cuisine with specialties. No credit cards.

Lion's Rock, 316 E. 77 St., 988-3610. Continental cuisine in charming setting with foliage and waterfalls. After-theater menu.



The Magic Flute, Broadway at W. 64 St., directly across from Lincoln Cen-
(Continued on Preview/70)

Our limited distance modems have one limitation. Distance. But even our distances are longer than most.

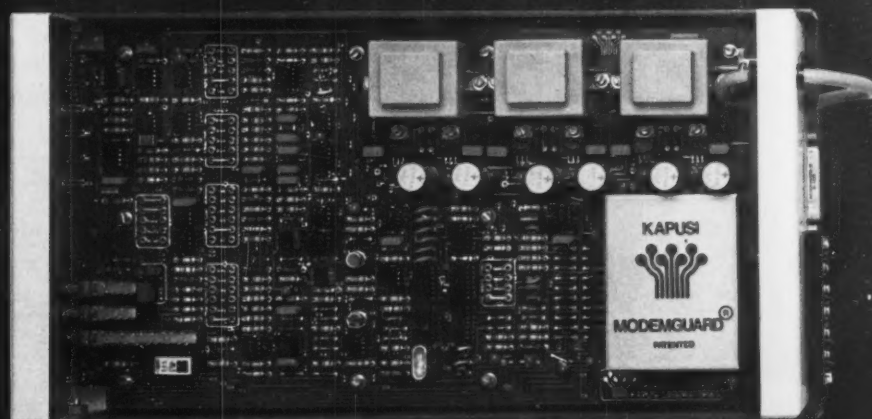


DT 19.2S Data Transceiver

- Operating modes: synchronous or asynchronous, 2 wire or 4 wire, point-to-point or multipoint
- Range: 4 km at 19,200 baud
10 km at 2400 baud
- Built-in SELFTEST, easy installation, 5msec poll turnaround time
- Price: from \$400 to \$600

DT 19.2L Data Transceiver

- Operating modes: synchronous or asynchronous, 2 wire or 4 wire, point-to-point or multipoint
- Range: 15 km at 19,200 baud
60 km at 2400 baud
- Completely immune to external overvoltages
- Price: from \$700 to \$1000



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The HP 2621: sim

Simple doesn't have to mean unsophisticated. The proof is in our new CRT terminal, the HP 2621.

Before building it, we took a long, hard look at the way you use a simple terminal. Then we took the knowledge gained in more than 10 years designing computer products and applied it to engineering an interactive character-mode CRT terminal from the user's point of view.

The outcome was actually two models. The HP 2621A, which sells for \$1450. And the HP 2621P, which has a built-in printer, costs \$2550. You obviously want the sharpest display made. So we used the 9x15 character cell you see on every HP CRT terminal, including the top-of-the-line. And, to help you look back at the data you've entered, we provided two full pages of continuously scrolling memory.

We designed the keyboard like the familiar typewriter, so you don't have to waste time relearning it. We built in eight function keys, too. These control the cursor, rolling and scrolling. And, to make life easier, they're labeled on the screen for self-test, configuration, display and editing.

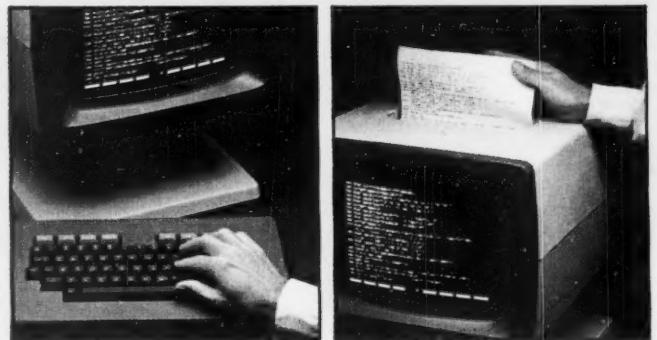
Editing? On a simple terminal? Certainly. We included character and line insert and delete, clear line and clear display. And, since the 2621 keeps your input separate from your CPU's, you can edit data before sending it to the computer. All without writing a line of system software.

Since flexibility is important in interfacing, we included a user-definable return key that will send your computer whatever code it expects. We also made our terminals compatible with RS232C and Bell 103A, and

able to communicate with your CPU at 110 to 9600 baud.

If you need hard copy at your fingertips, take a look at the HP 2621P. With a keystroke, its built-in 120 cps thermal printer will deliver a printout from the screen in seconds.

So why don't you check out the HP 2621 by calling the nearest HP sales office listed in the White Pages. Or send us the coupon. Then see for yourself how sophisticated a simple CRT terminal can be.



Try this on your favorite CRT! With the 2621P, you just hit a key and in seconds you have hard copy of your CRT display. The built-in thermal printer prints upper and lower case at up to 120 cps.

The 2621's bright, high-resolution CRT, with enhanced 9x15 character cell, displays the full 128-character ASCII character set, including upper and lower case, control codes, and character-by-character underline, in 24 80-character lines.

Eight screen-labeled preprogrammed function keys magnify the power of the 2621's keyboard. Preprogrammed functions include editing, terminal configuration, printer control and self-test.

To make numeric data entry faster and easier, we put the 2621's numeric keypad right in the middle of the keyboard. And the 2621's familiar 68-key keyboard is almost as easy to use as a typewriter.

- ☐ I'd like to know more about HP's new 2621A and 2621P with built-in hard copy.
- ☐ I'd like to see HP's new 2621A and 2621P with built-in hard copy.
- ☐ I'd like to know more about HP's complete family of terminals.

Name _____
Title _____
Company _____
Address _____
Phone _____

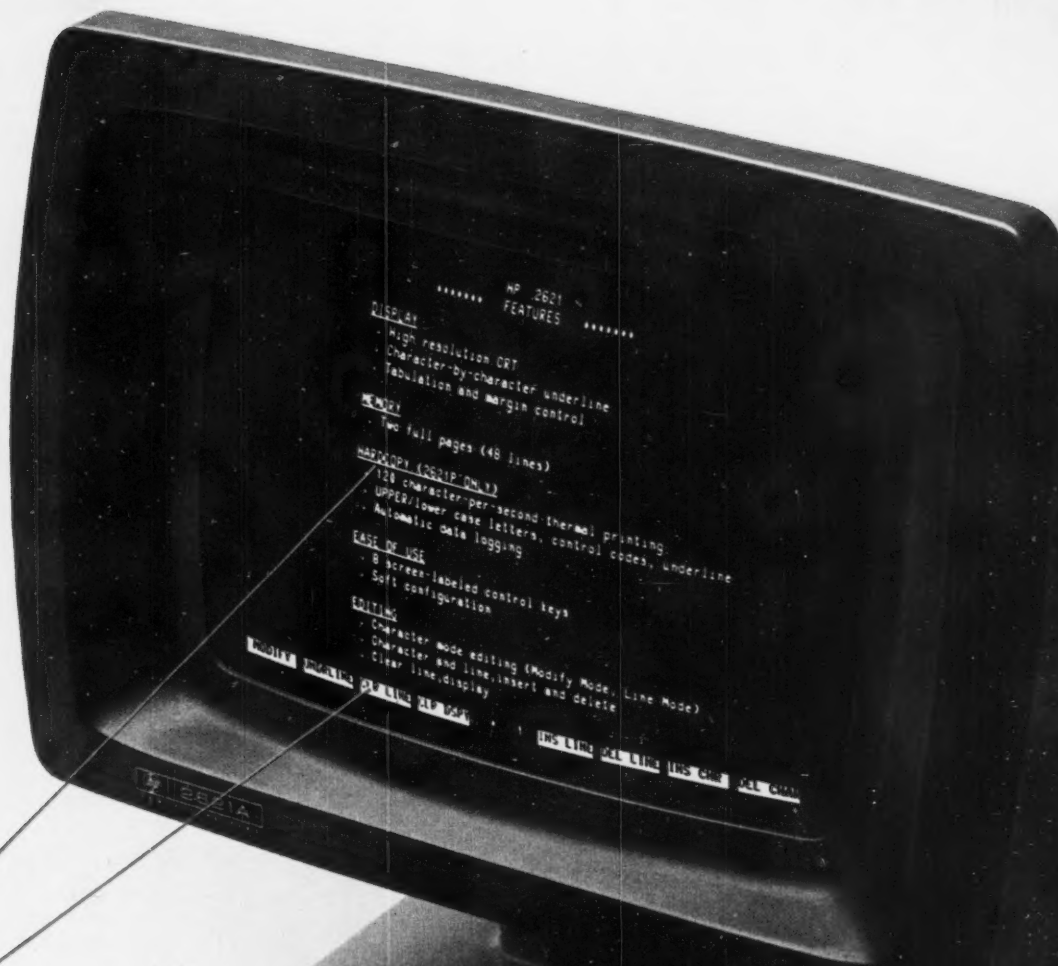
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HP 2621
FEATURES

DISPLAY

- High resolution CRT
- Character-by-character underline
- Tabulation and margin control

MEMORY

- Two full pages (48 lines)

HARDWARE (GCRIP ONLY)

- 100 character-per-second thermal printing
- UPPER/lower case letters, control codes, underline
- Automatic data logging

EASE OF USE

- 8 screen-labeled control keys
- Soft configuration

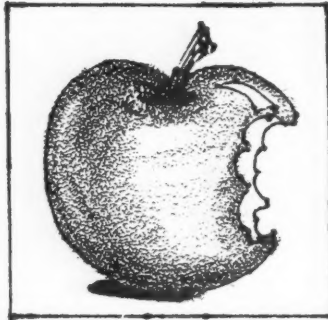
EDITING

- Character mode editing (Modify Mode, Line Mode)
- Character and line, insert and delete
- Clear line/display



42807MPT11

Restaurants in New York...



(Continued from Preview/67)

ter, 724-1340. Refreshing and cheerful, semicausal, featuring continental specialties and after-theater menu.

Maxwell's Plum, 1181 First Ave. at 64 St., 628-2100. Once the premier singles "in" spot. Now many tourists. Glamorous Tiffany decor and specialties.

Oggi, 1604 First Ave. between 83 and 84 Sts., 628-0383. Northern Italian cuisine in converted butcher shop. Menu recited by waiters.

O'Neal Brothers, 269 Columbus Ave. at 72 St., 399-2355. Popular West Side pub featuring hamburgers, steaks, salads and daily specials.

O'Neal's Balloon, 48 W. 63 St., across from Lincoln Center, New York law said no saloon, thus "Balloon." Sidewalk cafe and bar overlooking Lincoln Center. After-theater menu. No credit cards.

P.J. Moriarty, 1034 Third Ave. at 61 St., 838-2438. American restaurant with Tiffany chandeliers and paneling. After-theater menu.

Pancho Villa's, 1501 Second Ave. at 78 St., 650-1455. Authentic Mexican food in Mexican revolutionary theme room. After-theater menu. No credit cards.

Piccola Mondo, 1269 First Ave. between 68 and 69 Sts., 249-3141. Northern Italian cuisine in intimate but casual banquetette settings.

Pronto Ristorante, 30 E. 60 St. between Park and Madison Aves., 421-8151. Fresh pasta made in front of you and hot bread from wood oven. After-theater menu. Reservations required.

Quo Vadis, 26 E. 63 St. between Park and Madison Aves., 838-0590. Classic French cuisine in one of New York's finest restaurants.

The Ravelled Sleeve, 1387 Third Ave. between 78 and 79 Sts., 628-8814. Continental cuisine in casual yet romantic atmosphere. After-theater menu.

Seafood Gardens, 63 St. on Broadway, 799-7200. Shipshape seafood house near Lincoln Center.

Sea Venture, 1359 First Ave. at 73 St., 737-9660. Attractive setting for seafood. After-theater menu.

Sign of the Dove, 1110 Third Ave. at 65 St., 861-8080. French-Italian cuisine in one of the prettiest restaurants anywhere. Has received bad press in last several years.

Vagabondo di Mare, 1111 First Ave. at 61 St., 838-9743. Converted old neighborhood bar serving seafood and Italian cuisine.

Yellowfingers, 60 St. and Third Ave., 751-8615. International cuisine in bright and lively side walk cafe. Good spot after Bloomingdale's. No credit cards.

Good Bets On West Side

Act I, One Times Square, 695-1880. American and Continental cuisine with panoramic view of Times Square.

Al and Dick's Steak and Seafood House, 151 W. 54 St., 757-0095. Soft, candle-lit atmosphere with the best waiters. Pre- and after-theater menu.

American Cafeteria, 630 Fifth Ave. at 50 St. in Rockefeller Center Concourse Promenade, lower level, 581-3580. Handsome cafeteria decorated with state maps. Pastries baked on prem-

ises.

Aperitivo, 29 W. 56 St. between Fifth and Ave. of the Americas, 765-5155. Northern Italian cuisine which got three stars from one newspaper critic.

Arthur's, 44 W. 56 St., 581-9765. American and continental cuisine with showcase for new talent and singing waiters and waitresses. Pre- and after-theater menu.

Assembly Steak House, 16 W. 51 St. between Fifth and Ave. of the Americas, 581-3580. Attractive steak house acclaimed by critics.

Au Tunnel, 306 W. 48 St. between Eighth and Ninth Aves. 582-2166. French cuisine in small, family-operated bistro.

Barbetta, 321 W. 46th St., between Eighth and Ninth Aves., 246-9171. Northern Italian cuisine in stunning 18th Century Piemontese decor with summer garden.

Broadway Joe Steak House, 315 W. 46th St., 246-6513. American cuisine with after-theater menu.

Cafe Coco, 555 Seventh Ave. and 39 St., 354-0210. Continental and French cuisines in French re-creation in heart of garment center.

Capriccio, 11 W. 56 St., between Fifth and Sixth Aves., 757-7795. Specializing in Northern Italian cuisine, especially proud of homemade pasta.

Carnegie, 854 Seventh Ave. at 55 St. One of the best delicatessens in town,

AD adds the two best buys

Microprocessor with 52K bytes of RAM.

4 smart buffered display terminals.

2 diskette drives with 500K bytes total storage.

Parallel printer interface.

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System 75 is a natural for OEMs who supply applications in Basic or Fortran. It has language features usually found only on

More Eating. . .

Kosher-style, near Carnegie Hall. No credit cards.

Celestial Empire, 144 W. 46 St., 869-9138. Excellent Cantonese, Mandarin and Szechuan food in heart of the theater district.

Charley O's, 33 W. 48 St. between Fifth and Sixth Aves., 582-7141. Irish-American cuisine in warm and friendly pub atmosphere.

Cheers, 120 W. 41 St., between Sixth Ave. and Broadway, 840-8811. American and Continental cuisine in English Tudor decor.

Chez Napoleon, 365 W. 50 St. near Ninth Ave., 265-6980. Cozy out-of-the-way family establishment with excellent, flavorful and fresh Provincial

French food served with warmth.

Chez Raymond, 240 W. 56 St., 245-3656. French cuisine with specialties.

Chicago, 1775 Broadway between 58 and 59 Sts. American cuisine in Chicago pre-Prohibition, jazz era setting.

China Bowl, 152 W. 44 St., 582-3358. Chinese cuisine.

China Song, 1705 Broadway at 54 St., 246-6759. Cantonese cuisine, large bar and handsome wood carved screens from Hong Kong.

Chinese Republic, 1485 Broadway between 42 and 43 Sts., 594-2977. Chinese and American and lots of specialties.

Coffee Cafe, 1515 Broadway between

44 and 45 Sts., 997-1359. American cuisine in coffee plantation setting. Seven exotic blends brewed at your table. After-theater menu.

Copenhagen Cafe, 68 W. 58 St. between Fifth and Sixth Aves., 688-3690. New York's only Danish restaurant with charming Danish motif. Spectacular smorgasbord.

Crowing Cock, 1375 Broadway between 37 and 38 Sts. Irish and American food in intimate, authentic Irish atmosphere.

Diogenes, 937 Eighth Ave., 586-0470. Offering a variety of Greek and Continental cuisine in Mediterranean atmosphere.

Du Midi, 311 W. 48 St. off Eighth

Ave., 582-6689. Parisian bistro located in theater district with Provincial specialties for a gourmet.

El Jerez, 234 W. 56 St. between Broadway and Eighth Aves., 765-4535. Spanish rustic decor with Spanish cookery specialties.

Foro Italico, 455 W. 34 St., 564-6619. Northern Italian cuisine in rustic Italian decor.

French Shack, 65 W. 55 St. between Fifth and Sixth Aves., 246-5126. French cuisine with many specialties and wine selection.

Gallagher's Steak House, 228 W. 52 St. between Broadway and Eighth Ave., 245-5336. New York's official steak house for 45 years.

Giordano, 409 W. 39 St. between Ninth and Tenth Aves., 947-3883. Northern Italian cuisine in four dining rooms with open patio.

Ground Floor Cafe, 51 W. 52 St. at Ave. of Americas, 751-5152. Popular snacking spot in the CBS Building. After-theater menu.

Hawaii Kai, Broadway at 50 St. American, Polynesian and Chinese cuisines with a lavish luau.

HoHo, 1313 W. 50 St. between Sixth and Seventh Aves., 246-3256. Cantonese and Mandarin dishes in lovely modern setting.

Ho Shim, 120 W. 44 St., 575-9774. Japanese and Korean cuisine, oriental decor, with screens. After-theater menu.

House of Chan, 52 St. and Seventh Ave., 757-4470. Cantonese and Szechuan dishes ranging from the traditional to the exotic.

Italian Pavilion, 24 W. 55 St. between Fifth and Sixth Aves., 586-5950. Italian and continental cuisine in elegant setting and year-round garden room.

Joe's Pier 52 Seafood Restaurant, 144 W. 52 St. between Sixth and Seventh Aves., 245-6652. Typical theatrical and nautical decor with world's biggest shrimp.

LaCaravelle, 33 W. 55 St., 586-4252. French haute cuisine, among the very top of New York's fine French restaurants. Quality is never compromised. No credit cards.

La Fondue, 43 W. 55 St. between Fifth and Sixth Aves., 581-0820. Outstanding continental cuisine in charming European cellar atmosphere. Casual dress. After-theater menu. No credit cards.

Landmark Tavern, 626 Eleventh Ave. at 46 St., 757-8595. Marvelous "saloon" with pot-bellied stove, mahogany bar, Irish-American cuisine and home-made soda bread. After-theater menu. No credit cards.

Le Chambertin, 348 W. 46 St. between
(Continued on Preview/73)

ADD S in distributed processing.

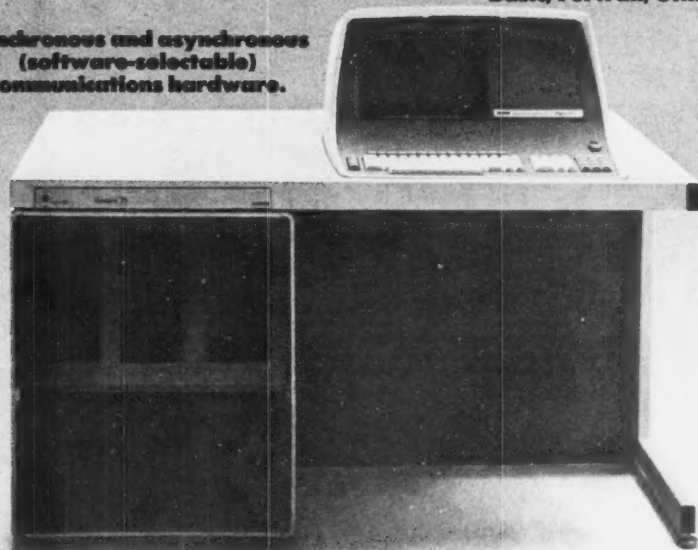
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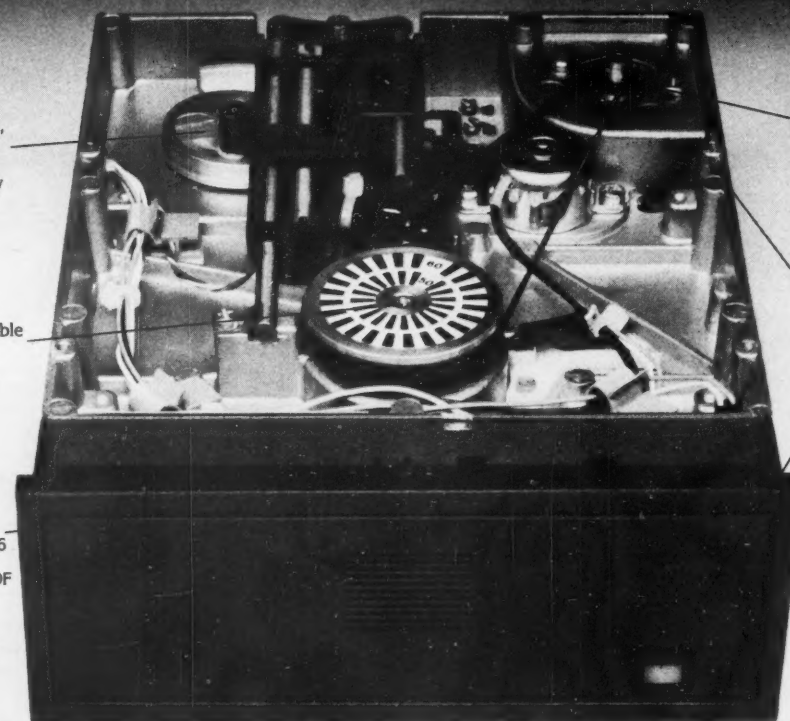


Before you specify your next floppy disk drive, BASF has a small suggestion.

The 6106 uses a ball bearing, friction-free head positioner traveling in a spiral cam... resulting in less susceptibility to vibration or uneven wear.

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THE NEW BASF 6106 IS ONLY 2.1" HIGH. THREE 6106 DRIVES FIT IN THE SAME VERTICAL SPACE AS TWO OF OUR COMPETITION'S.



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BASF

Chow Time in the Big Apple

(Continued from Preview/71)

tween Eighth and Ninth Aves., 757-2154. Attractive setting and good French food.

Le Quercy, 52 W. 55 St., 265-8141. Friendly and attractive new place serving authentic French Provincial food from Quercy region.

Les Pyrenees, 251 W. 51 St. opposite Uris and Circle-in-the Square theatre, 246-0044. Superb French cuisine with Pyrean flair.

Londonderry Pub, 134 W. 51 St. Irish cuisine, hearty pub. A mecca for junior executives.

Los Madriles, 236 W. 52 St., 582-3193. Spanish and American cuisine specialties. After-theater menu.

Ma Bell's, 45 St. west of Broadway on Shubert Alley, 869-0110. Private booths with working phones on the table. American cuisine, after-theater menu.

Magic Pan Creperie, 1409 Ave. of the Americas between 57 and 58 Sts., 765-5080. Part of countrywide chain serving crepes in French country inn at reasonable prices.

Maharlika Restaurant at the Philippine Center, 556 Fifth Ave., 575-7802. Only Filipino gourmet restaurant in New York. Room with torches of Malay-Moslem heritage. Entertainment.

Marta's of Bergen Street, 249 W. 49 St. between Broadway and Eighth Aves., 265-4317. Italian cuisine in warm, comfortable spot.

Mercurio, 53 W. 53 St. between Fifth and Sixth Aves., 586-4370. Northern Italian cuisine.

Miyako, 20 W. 56 St., 265-3177. Oldest Japanese restaurant in New York with pillow-and-chair seating. Tempura, teriyaki and sukiyaki.

O'Neal's, 60 W. 57 St., 399-2361. Continental cuisine, smartly informal. Live chamber music at Sunday brunch.

Pantheon, 689 Eighth Ave. between 43 and 44 Sts., 840-9391. Very pleasant, low-key Greek-American restaurant convenient to theaters. Lamb specialties.

Patsy's Italian Restaurant, 236 W. 56 St. between Broadway and Eighth Ave., 247-3491. Italian cuisine in modern first floor and or Roman second floor.

Pergola des Artistes, 252 W. 46 St., 586-9078. Pleasant setting for well-prepared French food. Complimentary glass of wine.

Piraeus My Love, 117 W. 57 St., 757-8847. Traditional and innovative Greek cookery.

Pot au Feu, 123 W. 49 St. in Rockefeller Center, 765-4840. New concept in dining, featuring hearty soups, stews and salads. No credit cards.

Promenade Cafe, Rockefeller Plaza, 757-6271. Overlooking the famous ice skating rink. American cuisine.

Pub Theatrical, 1633 Broadway, corner of 51 St., concourse level. 581-7700. American cuisine in part of the theater complex.

Rago, 57 W. 58 St. between Fifth and Sixth Aves., 757-3450. Superb Indian cuisine served in spacious, elegant room decorated with native musical instruments.

The Rainbow Room, 30 Rockefeller Plaza, 757-9090. Famous romantic restaurant with good food and view from 65th floor of RCA Building. After-

theater menu.

Rock Garden of Tokyo, 34 W. 56 St., 245-7936. Superb Japanese specialties.

Roseland, 239 W. 52 St. between Broadway and Eighth Ave., 247-0200. World's most famous ballroom-restaurant and New York's largest dance floor. Moderately priced American food.

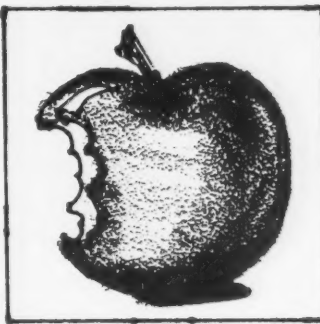
San Marco, 36 W. 52 St., 246-5340. Italian cuisine at its best.

Sardi's, 234 W. 44 St. between Seventh and Eighth Aves., 221-8440. Famous theatrical restaurant with after-theater menu and continental specialties.

Swiss Pavilion at Swiss Center, 4 W. 49 St. Elegant simplicity and unique

mix of Swiss culinary styles.

Tavoo's, 30 W. 52 St. between Fifth



and Sixth Aves., 541-7777. Iranian, Indian, and international cuisine with many specialties.

Thursdays, 57 W. 58 St. between Fifth and Sixth Ave., 371-7777. American food in duplex restaurant with suspended dance floor. After-theater menu.

Toots Shor, 64 W. 52 St., 757-8275. American cuisine from last of the great saloonkeepers.

Topkapi Palace, 18 W. 56 St. between Fifth and Sixth Aves., 765-8782. Authentic Turkish restaurant.

21 Club, 21 W. 52 St. between Fifth and Sixth Aves., 582-7200. Fashionable restaurant serving fine American (Continued on Preview/75)

Cut your computer output costs by 60% or more with a Kodak laser printer.

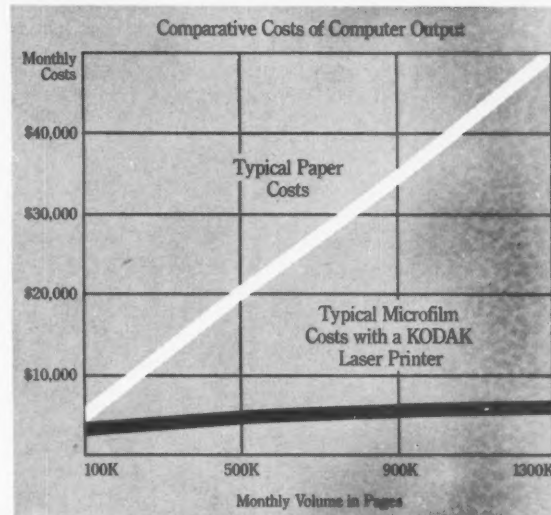
Even in a small DP department, it doesn't take long for a printer to swallow a ton of paper.

A Kodak Komstar microimage processor, on the other hand, doesn't use any paper at all. Instead, it prints on microfilm. Which can save you more than 60% on the costs of generating, packaging, and distributing computer output reports.

A Komstar microimage processor is 6-8 times faster than an impact printer. It's dry, and can operate either on-line or off-line. You can save time. Save labor. Save equipment and supply costs.

Which explains why more and more companies every day are taking advantage of computer output microfilming from Kodak.

To find out how Kodak products can cut costs in your DP operation, just answer the 5 questions below. We'll send back a detailed report providing a return-on-investment analysis.



Kodak Komstar microimage processors. The printers that print without paper.



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Answer these 5 questions to get a detailed analysis.

1. What kind of computer configuration(s) do you have now?

2. What is your total monthly volume of computer printout pages?

3. What is your cost for one-part forms?

4. What is the average number of copies per page (set size)?

5. What is the hourly labor cost with fringes?

☐ Please send me more information on Kodak Komstar laser printers.

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Unfortunately you will be facing the computing problems of the 80's. Fortunately you will be facing them with the Harris S800.



Here is the pacesetter computer system of the 1980's.

The new Harris S800. A computer system that will set a new standard for computational speeds and multi-tasking throughput. A computer man's computer. Equally adept at both computational and interactive processing.

A workhorse. Designed for use by a multi-disciplined staff. In fact, if you're thinking of purchasing DEC's VAX 11/780 — Think again. Think of the Harris S800 — the fastest and most powerful computer system of its price and class in the world.

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Chomp! Chomp! Chomp!

(Continued from Preview/73)
and continental cuisine. Reservations recommended.

United States Steakhouse, 120 W. 51 St. between Sixth and Seventh Aves., 757-8800. Prime steaks and chops plus imaginative American foods. Reservations required. Specialties: cream-of-peanut soup and six-nut pie. Reservations required.

Good Choices On East Side

Akbar, 475 Park Ave. between 57 and 58 Sts., 838-1717. Serving special Indian Muglai cuisine. Reservations.

Amalfi, 16 E. 48 St., 758-5110. Italian cuisine. Established 1927. Warm, homelike atmosphere.

Antolotti's, 337 E. 49 St., 688-6767. Italian and continental cuisine. Established 26 years. Rated one of the finest Northern Italian restaurants.

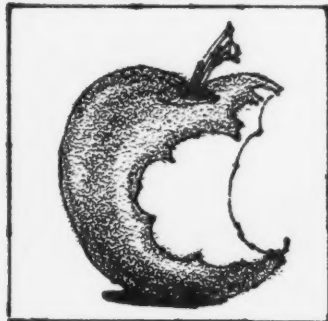
The Ararat, 4 E. 36 St. between Madison and Fifth Aves., 686-4622. Excellent Armenian cuisine featuring Middle East specialties.

Autopub, 59 St. and Fifth Ave. in General Motors Building, 832-3232. Great fun to dine in a car. American steaks and chops.

Bacara, 203 E. 45 St. between Second and Third Aves., 682-4505. Elegant yet moderately priced Italian restaurant.

Benihana of Tokyo, 120 E. 56 St. between Park and Lexington Aves. 593-1627. Japanese decor and food prepared at your table by chefs trained in showmanship and flair.

Blueprint 100, 100 Park Ave. at 40



St., 684-4500. Sumptuous dining, modern elegance. Continental and Italian Cuisine.

Brasserie, 100 E. 53 St., 751-4840. A pleasant, reasonably priced place open 24 hours a day, seven days a week. French ambience. They will also make a picnic basket if the spirit moves you.

The Brewery, 85 E. 45 St., 563-7440. Modeled after interior of pre-Prohibition brewery complete with mixing vats and brewer's pipelines. Help yourself to giant barrel of peanuts.

Bruce Ho's, 116 E. 57 St. between Park and Lexington Aves. 753-2610. Cantonese food well prepared and served in elegant surroundings.

Brussels, 115 E. 54 St. between Park and Lexington Aves. 758-0457. Haute French in Old World townhouse with exceptional wine cellar.

Cafe Argenteuil, 253 E. 52. at Second Ave., 753-9273. French cuisine in French Provincial atmosphere.

Cafe Europe, 347 E. 54 St. between first and second Aves., 755-0160. Continental cuisine, French Provincial decor. After-theater menu.

The Cattleman, 5 E. 45 St., 661-1200. Adult Western restaurant with steaks, prime ribs and fine food in elegant old San Francisco setting.

Charlie Brown's, Pan Am Building, 45th St. between Vanderbilt and Lexington Aves., 661-2520. Best thing is the location adjacent to Grand Central Station. Nice meeting place; nibbles at cocktail hour.

Christo, 143 E. 49 St. between Third and Lexington Aves. Italian cuisine in old-fashioned paneled decor. After theater menu.

Clos Normand, 42 E. 52 St. between Park and Madison Aves, French cuisine in beautiful Normandy decor.

Club Ibis, 151 E. 50 St., 753-3884. Gourmet's dream come true in stunning reproduction of a Nile palace during Cleopatra's reign.

Copain, 891 First Ave. at 50 St., 758-0554. "French Connection" filmed here. Continental cuisine.

Copter Club, 200 Park Ave., Pan Am Building, 973-2100. Skyline dining with limited menu.

The Cotton Patch, 1068 Second Ave. at 56 St., 688-6595. New York's leading Southern-owned and operated restaurant in cozy 100-year-old bar with special hickory-smoked pit barbecue.

The Cowboy, 60 E. 49 St. between Madison and Park Aves., 697-2500. Chili, burgers and barbecue and 75-foot copper bar.

Crowing Cock, E. 46 St. in Hotel Roosevelt, 536-7440. Irish cooking and setting featuring "cozees" — little private nooks for parties of two, four or six.

Curds 'N Whey Cafe, 4 E. 45 St., 682-8876. Health food cafeteria with wood and greenery.

Delegates Dining Room at the United Nations, First Ave. at 46 St., 754-7625. Public admitted 11:30 a.m. No reservations. International cuisine. No credit cards.

(Continued on Preview/78)

Datapoint will lease you this 420K Computer System for \$1,950* a month and ship it in about 12 weeks.

ARCPAC™ gives you mainframe power without mainframe headaches, and costs only \$2.21* per user per hour.

Now you can get business computing power with multilanguage and telecommunications capabilities. With easy growth, at reasonable prices, Datapoint has the system for you. We call it the Attached Resource Computer™ system, or ARC™ for short. The major components are proven Datapoint hardware. That's why we can ship you an ARCPAC in about three months with all necessary processors, disks, connecting cables and system software. All at a new, low, packaged price.

The bigger it gets, the better
ARCPAC is a multilanguage, multifunction, multiterminal system for both batch and transaction processing. Any processing work station runs COBOL, RPGPLUS, BASIC-PLUS, DATASHARE® and all Utilities.

The system can grow as your needs increase—simply, easily, in incremental steps, at affordable costs, and without re-programming. Unlike most large systems, it actually gets better as it grows.

The ARCPAC shown here, for example, can handle 1.85 million instructions per second (mips). Add on another 60K processor and the system's capacity increases to 2.05 mips. A second 60K processor added on brings it up to 2.3 mips. And on and on, almost without limit.

No systemwide failures
Because of its architecture, if part of the system goes off-line, you're still in business. Other parts of the system can simply take over for the off-line processor, or a replacement processor can be quickly plugged into the system. Either way, the system keeps right on working.

The ARCPAC Package
ARCPAC is designed to make it easy for you to get into attached processing. The package comes in two versions: with 20MB of disk storage or, for a little higher price, 120MB. Both packages include five 60K applications processors and one 120K file processor, plus all connecting cables, system software, and languages, at the low package prices.

You have plenty of add-on options to configure the ARCPAC precisely to your needs. These options can include additional processor power, more disk capacity, extra terminals and compatible Datapoint peripherals like printers, magnetic tape drives and

others. You have a wide choice of telecommunications systems to make the ARCPAC part of a geographically dispersed network.

The two-year lease rate is \$1,950 per month for the basic ARCPAC with 20MB of disk storage. One- and three-year leases are also available. Maintenance is currently \$552 per month extra.

Nationwide customer service
Datapoint has 665 Customer Service Representatives stationed in 138 local service offices around the country. Customers call one toll-free number, 24 hours a day, seven days a week, when they need service, and are usually in contact with a service rep in less than an hour.

The Datapoint approach
Datapoint out-thinks its competition to help you out-think yours. ARCPAC is just one of the ways. Datapoint made dispersed data processing feasible and is building now toward the integrated electronic office of the future. Whether you need a hundred small systems for your branch offices or a major computing facility for corporate headquarters, Datapoint has an answer.

For more information on ARCPAC, simply send in the coupon.

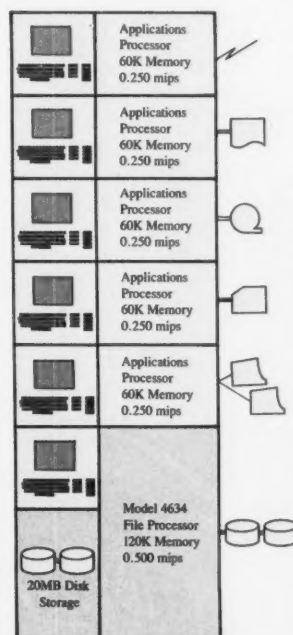
*Based on the monthly two-year lease rate with five users and an average of 176 working hours per user per month. Does not include maintenance.

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TO: Marketing Communications Department (M62)
Datapoint Corporation
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San Antonio, Texas 78284
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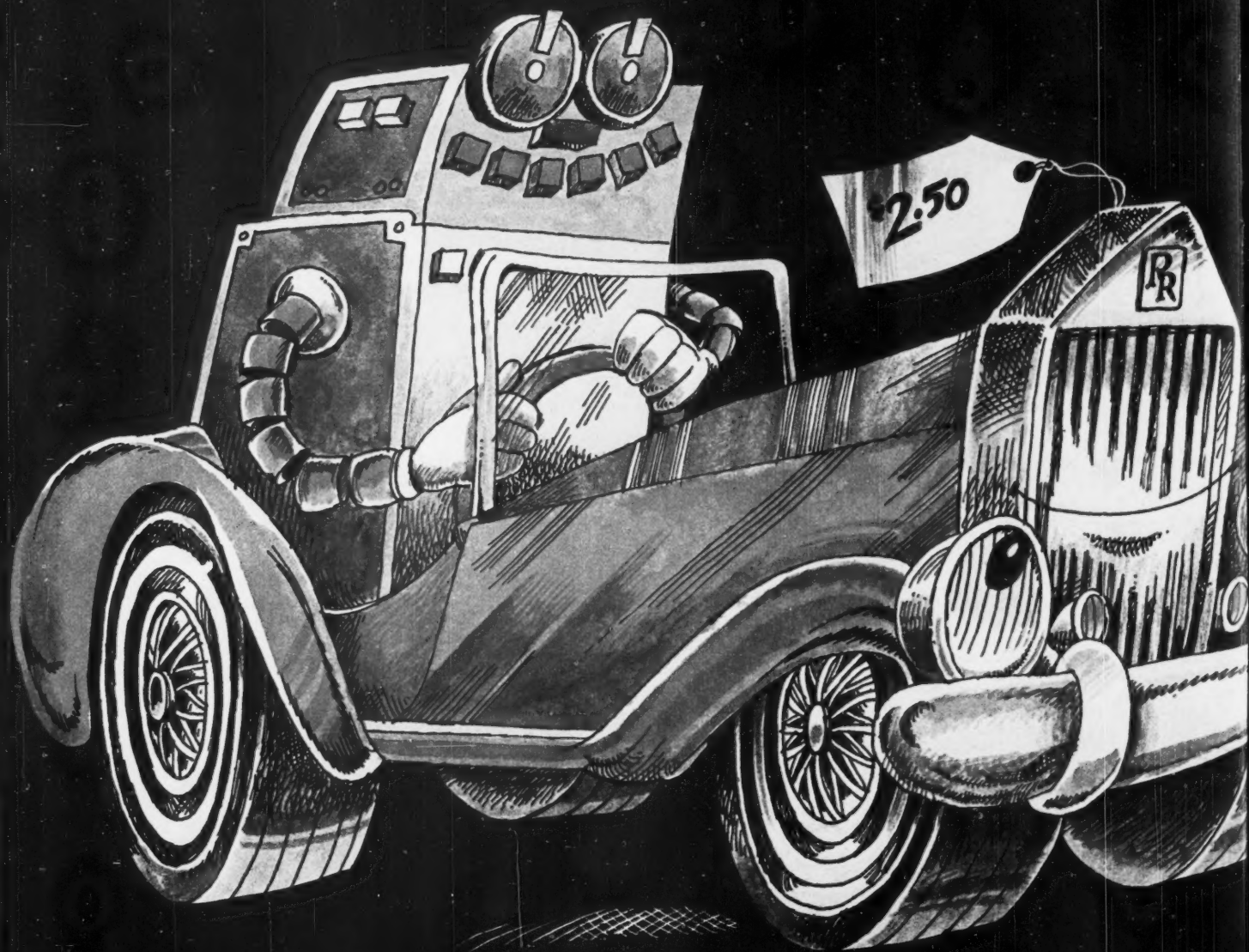
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ARCPAC. 420K memory, 20MB disk memory illustrated here. Each applications processor is multilanguage, multifunction.

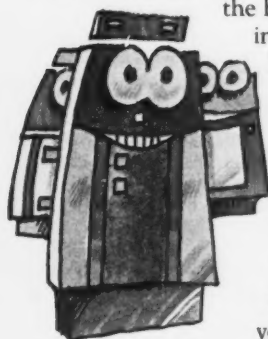
**"If the auto industry had done
what the computer industry
has done in the last 30 years, a
Rolls-Royce would cost \$2.50
and get 2,000,000
miles per gallon."**



Computers aren't just an industry, they're a revolution in the way mankind operates. And no one covers this revolution better than we do!

We are CW Communications/Inc. and despite our youth (we'll be 12 this year) we're the world's largest publisher of newspapers and magazines for computer people all over the world.

Most of our publications are weekly newspapers, because so many things happen so rapidly in the computer business (as the headline quote from a prominent industry executive makes so clear).



In only thirty years the industry has gone from the development of the giant Eniac system, through the tube-powered, water-cooled Univac I (the world's first business computer), to the incredibly cheap, battery-powered microprocessor.

But as unbelievable as the last 30 years have been, the next 30 will probably be even more incredible.

Right now, IBM has begun delivery of a new computer series that will, by itself, provide four times as much processing power as all the previous computers delivered by the company. And they have announced a new "superconductor" that could improve computer speed and performance by a factor of 500 in the next seven years! It's hard to remember this is real science, not fiction.

This extraordinary increase in efficiency has led to a rapid expansion in computer use, as human ingenuity finds more and more applications for these powerful tools. So the market for computer products and services has turned out to be more elastic than most observers had thought. Worldwide expenditures are currently at \$75 Billion, and growing by 20% a year.

A constant flow of new products; rapid changes in technology; more and more new applications; and large and growing expenditures. It's an industry with a strong need for current, complete and accurate information. Which is where we come in.



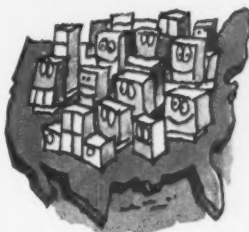
Our oldest publication is **COMPUTERWORLD**, a weekly newspaper with a growing all-paid circulation that should reach 100,000 in 1979



(quite an increase from our modest 7,500 in 1967). **COMPUTERWORLD** serves America's computer users with the consumer-oriented, objective information they need.

And it has become one of America's top ten business publications, with advertising revenues of \$13.5 million.

Our newest publication is **COMPUTER BUSINESS NEWS**, a weekly newspaper for executives in the U.S. computer industry whose organizations are involved in the manufacture or integration of computer systems. This is a relatively new marketplace which has grown up around the minicomputer and micro-computer, and which shows every sign of very rapid growth for at least the next decade.



The United States alone accounts for nearly half of the worldwide computer market, but billions of dollars are spent by foreign computer people for American-made computers and computer products. And our publications penetrate those marketplaces, too.

We are publishers of newspapers and magazines in the following markets:

Country	World Rank as Computer Market	Publication
Japan	2	Shukan Computer
West Germany	3	Computerwoche Team (Office of the Future)
United Kingdom	4	Computer Management
Australasia	9	Australasian Computerworld
Brazil	17	Data News

In addition, we provide editorial services for, and U.S. advertising sales representation to, the following publications:

Zero-un Informatique (France)
Computing Canada (Canada)
EDP Notizie (Italy)
Sistemi E Automazione (Italy)
Computadoras Y Sistemas (Argentina)

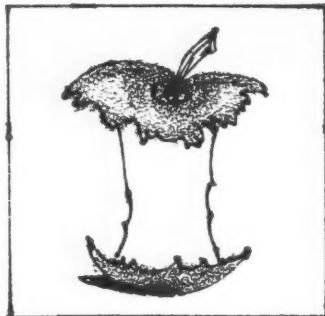
Computing is an exciting industry, with a unique need for information. And the publications we produce provide that information to hundreds of thousands of computer people around the world. They are excellent vehicles for reaching these people with your advertising message, and we'd be happy to give you more information on any of them. Just call or write, Roy J. Einreinhofer, Vice President, Marketing.



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Eating Out in New York



(Continued from Preview/75)
Dezaley, 54 E. 58 St., 755-8546.
 Swiss cuisine.

El Parador Cafe, 325 E. 34 St. between First and Second Aves., 679-6812. Mexican dishes in romantic atmosphere.

Fonda La Paloma, 256 E. 49 St. between Second and Third Aves., 421-5495. Mexican cuisine in townhouse with strolling guitarist.

Four Seasons, 99 E. 52 St., 754-9494. The one and only. Menu and decor change with seasons. Some say this is a must place for New York visitors.

Gavroche, 222 E. 58 St., 838-0279. Excellent authentic French cuisine, three stars by some critics.

Giambelli 50th, 46 E. 50 St. between Park and Madison Aves., 688-2760. and **Giambelli Madison**, 238 Madison

Ave. between 37 and 38 Sts., 685-8727 — the original. Authentic Northern Italian cuisine.

Gian Marino, 221 E. 58 St., 752-1696. More than 200 Italian dishes, including 65 pastas.

Gloucester House, 37 E. 50 St. between Park and Madison Aves., 755-7394. American seafood — fresh. Model ship display and scrubbed table tops.

Guv-nor Steak House, 303 Madison Ave. between 41 and 42 Sts., 867-0540. Brick and wood-paneled background for charcoaled steaks and lobster.

Horn & Hardart, 200 E. 42 St. at Third Ave., 972-1837. The last auto-

mat.

Il Rigoletto, 232 E. 53 St., 759-9384. Italian cuisine in intimate European setting with operatic music.

Joyce's Steak & Seafood House, 948 Second Ave. at 50 St. A New York rarity, an enchanted place where good foods and wines are served with Irish friendship.

Kamehachi, 14 E. 47 St., 765-4737. Japanese cuisine specializing in tempura and raw fish.

Kitty Hawk, 565 Third Ave. at 37 St., 661-7406. American food served along side aeronautical memorabilia and antiques.

Knickerbocker Pub, 39 E. 49 St. at Madison Ave., 563-7440. American cuisine served with a touch of Little Old New York. Quaint patio facing Madison Ave.

La Bibliotheque, 341 E. 43 St. between First and Second Aves., 661-5757. French cuisine. Overlooks United Nations fountains.

La Cote Basque, 5 E. 55 St. between Fifth and Madison Aves., 688-6525. Classical French with handpainted murals by Gernard Lamotte of the Basque country. Expensive. Guide book says "exclusive clientele."

La Fortuna, 16 E. 41 St., 685-4891. Primarily Northern Italian food with at least one dish from every Italian province.

La Maison Japonaise, 334 Lexington Ave. at 39 St., 682-7375. Unique blend of French cooking with an Oriental accent at family prices and near Grand Central Station.

La Rotisserie, 153 E. 52 St., 759-1685. Authentic French in beautiful decor.

Laurent, 111 E. 56 St. between Park and Lexington Aves., 753-2729. French cuisine in elegant, spacious surroundings and seasonal specialties.

Le Bistro, 827 Third Ave. at 50 St., 759-8439. If the atmosphere doesn't convince you that you're in a Paris bistro, the food will. At this location 40 years.

Le Chanteclair, 18 E. 49 St. between Madison and Fifth Aves., 755-7731. French cuisine, bar with auto racing motifs and dining room with Paris murals.

Le Chateau Richelieu, 48 E. 52 St., 751-6565. French and continental cuisine in elegant Parisienne atmosphere.

Le Cheval Blanc, 145 E. 45 St. between Lexington and Third Aves., 599-8886. Excellent French cuisine reasonably priced with good service.

Le Cygne, 53 E. 54 St. between Park and Madison Aves., 759-5941. Known for the ultimate in haute French cuisine. Elegant decor reflects original City Plans of Paris in 1734. Unique dining experience.

Le Madrigal, 216 E. 53 St., 355-0322. Bright, cheerful French ambience brings you back to the days of the troubadours depicted in the restaurant murals. Illusion of dining outside while inside.

Le Manoir, 120 E. 56 St., 753-1447. Classic Gallic cuisine.

Le Moai, 942 Third Ave. between 56 and 57 Sts., 688-8860. French cuisine with many specialties.

Londonderry Pub, Park Ave. at 39 St., 687-9513. Irish cuisine, Healey pub. A mecca for junior executives.

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More Restaurants...

Best Picks From New York Magazine

Mimi Sheraton is the *New York Times*'s both loved and hated restaurant critic. Her choice of New York's best restaurants include:

The Coach House, 110 Waverly Place, Greenwich Village, 777-0303. Variety of dishes prepared in grand manner and served in handsome surroundings. Prices are high but worth it.

Palm, 837 Second Ave. between 44 and 45 Sts., 687-2953. Best steak in New York, but expensive. No menu. Style is antistyle with sawdust on the floor. Also favorite of Computerworld Editor E. Drake Lundell Jr. Save room for the cheesecake.

Le Cygne, 53 E. 54 St., 759-5941. Best French restaurant, Sheraton said last October. Main courses are the rave. Fixed price dinner.

Lutece, 249 E. 50 St., 752-2225. Second-best French restaurant in New York, according to Sheraton, because unknown customers don't get ultra-carefully prepared dishes. More ambience than Le Cygne.

Christ Cella, 160 E. 46 St., 697-2479. Second-best steakhouse in New York City. Steak is great, but that's all. Better, more gracious service than at the Palm.

Kitcho, 22 W. 46 St., 575-8880. "Most serious and authentic Japanese restaurant I have found," says Sheraton. The raw fish is so fresh "it might have swum onto the exquisitely decorated platters."

Hatsuhana, 17 E. 48 St., 355-3345. Best place for sushi bar, rice and raw fish.

Bangkok Cuisine, 885 Eighth Ave., 581-6370. Great Thai dishes. House specialty is a foil-wrapped, baked combination of shellfish and vegetables in sheer, golden fish broth.

Reonthep, 860 Ninth Ave., 586-2240. Despite decor, good Thai food, incomparable barbecued chicken, beef salad, whole fried fish and pork balls in lettuce leaves. Good prices.

Le Chantilly, 106 E. 57 St., 751-2931. "I find it somewhat amazing that even at so early a date, I rank this newcomer close to its more experienced haute cuisine competitors," Sheraton said in October. Desserts are "gorgeous in both appearance and taste" and the "penultimate." Fixed price lunch and dinner.

Rao's, 455 E. 114 St., 534-9625. One of Sheraton's out-of-the-way finds in Spanish Harlem. A restaurant with only seven tables where Italian food is cooked to order — no stuffed pastas, stews or roasts that must be done in advance. The real house triumph is chicken grilled with olive oil to a charred, crackling succulence that's sharpened by a splash of fresh lemon juice. Clientele is out of "Guys and Dolls" and "The Godfather."

Salta in Bocca, 179 Madison Ave., 684-1757. Out-of-the-way place for Northern Italian food. One of Sheraton's two favorites.

Il Monello, 1460 Second Ave. between 76 and 77 Sts., 535-9310. Favorite for Northern Italian food which

overcomes the decor. Try anything with clams, Sheraton suggests.

Sea Fare of the Aegean, 25 W. 56 St., 581-0540. Although its prices are sky high, fish and seafood are wonderful. Avoid lackluster New England clam chowder and frozen French fries.

Jane Street Seafood Cafe, 31 Eighth Ave., Greenwich Village, 243-9237. Cape Cod-like setting with young staff serving simply prepared fish dishes.

The Fish Place, 570 Hudson St.,

Greenwich Village, 243-4212. "Simple and attractive dining room that combines elements of the oriental and continental kitchens and does so with considerable success."

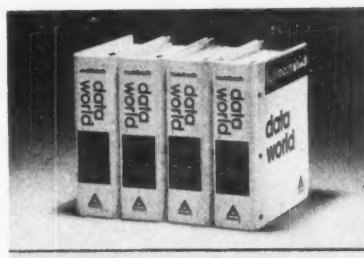
Hissae's Place, 35 Cooper Sq., 228-6886. Many of the same dishes as at "The Fish Place."

Yun Luck Rice Shoppe, 17 Doyers St., Chinatown, 571-1375. Sheraton's favorite Chinese. A "large, sprawling, glorified luncheonette, with two hectic

dining rooms, yellow plastic tablecloths, Chinese signs on the walls announcing the daily specials and a clientele that is 60% Chinese. Prices are unbelievably low for truly extraordinary food (excepting only the commonplace dishes)," she says.

Hee Seung Fung Teahouse, 46 Bowers, 374-1319. Mecca for dim sum, the traditional Chinese dumpling filled with shrimp, crab, pork, beef or

(Continued on Preview/81)



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NATIONAL -SPECIAL LEAR SIEGLER ISSUE- INFORMER

FRISBEE ACHIEVES ORBIT!

May 28, 1979

All the pieces fit:

PROJECT Y PUZZLE COMPLETE

Lear Siegler's
Smart Ideas Evolved
From a Dumb One

Page 4

★ ★ ★

The Great Contest of '79:
Computer vs. Abacus

Page 5

★ ★ ★

Computer a la Carte—
A Designer Menu of
Peripherals

Page 6

★ ★ ★

Dumb Terminal Called
"An Industry Mainstay"

Page 3

★ ★ ★

Buzzwords
You've Known and Loved

Page 17

★ ★ ★

LSI Spokesman Claim,
"There Is No Project Z"

Page 10



Declassified Project Y photo of Lear Siegler's Computer a la Carte "menu" of peripherals. Early reports indicate heavy salivation among competitors when showed the photo. NATIONAL INFORMER PHOTO

At last, the National Informer can reveal Lear Siegler's semi-secret Project Y in its entirety.

Late last night, it was revealed to our intrepid *National Informer* operative that Lear Siegler will unveil the last piece of the Project Y puzzle at the NCC. Called Computer a la Carte, the final piece is actually a kind of designer menu that allows customers to choose from available peripherals and options and build a suitable system.

The *National Informer* also learned that the 1000/4 Data System, as well as the 415 Data Processor, will appear at the NCC. The 1000 Data System, *National*

Informer readers will recall, incorporates mainframe features in a small affordable computer system. Equipped with a multiplexer to provide either 4 or 8 parts, it has the capacity for further expansion (and more terminals) if required.

The basic system consists of a 16-bit CPU, 32K, 16-bit words of dynamic RAM, (expandable to 64K), Dumb Terminals (or optional smart ones), a 180 cps, bi-directional 300 Series Ballistic Printer™, and a 10 megabyte cartridge disk (expandable to 40 megabytes of storage capacity).

This information was enough to stagger us at the *National Informer*, but there are even more features on the amazing 1000 we are being pressured to withhold.

The 415 Data Processor is a Nova* 1200 compatible CPU with 32K, 16-bit words of memory (expandable to 64K). It is housed in a card chassis with five additional slots for 15" square boards and a hefty power supply. The 415 offers both QUBUG (Quick Diagnostic Debugging Program), and firmware diagnostics. Not to mention a mind-boggling bevy of options. (Please turn to Page 9, Column 4)

*Nova is a registered trademark of Data General Corporation.

Eats! Eats! Eats!

(Continued from Preview/79)

Magic Pan Creperie, 149 E. 57 St., 371-3266. Part of the countrywide chain serving crepes in French country inn at reasonable prices.

Mario's Villa d'Este, 58 E. 56 St. between Park and Madison Aves., 759-4025. French and Italian cuisine with bright, bubbly fountain. One critic gave it three stars.

Mitchell's Place, No. 3 Mitchell Place, 49th St. and First Ave., 689-5227. Romantic and exciting spot atop Beekman Tower Hotel. Deli-in-the sky.

Olivers', 141 E. 57 St. between Third and Lexington Aves., 753-9180. Cozy pub serving food at yesteryear's prices.

O'Lunney's Country Music City, 915 Second Ave. near 49 St. Country music spot with generous entertainment policy and moderate prices in a casual atmosphere.

Oyster Bar, Grand Central Station, Lower Level, 42 St. and Vanderbilt, 532-3888. One of the best places for fresh fish and oyster stew in the city. This is the original Oyster Bar; opened in 1913, now completely refurbished.

Palm Too, 840 Second Ave. between 44 and 45 Sts., 697-5198. Branch of the famous Palm Restaurant with cartoons on the wall, sawdust on the floor and fabulous lobster and steak on table.

Paparazzi, 964 Second Ave., corner 51 St. 759-7676. All kinds of Italian dishes in atmosphere that is supposed to attract celebrities.

Paul's Steak Pub, 687 Lexington Ave. between 56 and 57 Sts., 421-8730. American steaks and chops in informal, friendly atmosphere.

Pen & Pencil, 205 E. 45 St. between Second and Third Aves., 682-8660. Most distinguished steakhouse. Clientele that includes lawyer Roy Cohn.

Pronto Ristorante, 801 Second Ave.

Mimi's Picks

(Continued from Preview/79)

chicken.

Peng's, 219 E. 44 St., 682-8050. prices are higher uptown than in Chinatown, but some of the dishes here are more intricate. Hunan cooking at its best, including a "crisply intriguing vegetable pie, its fried crust suggesting duck skin all wrapped in a crepe."

Ruc, 312 E. 72 St., 650-1611. Best Czech specialties. A gastronomic bargain in New York City.

Czechoslovak Praha, 1358 First Ave., 988-3505. Half-a-duck dinner and all that goes with it may be best buy in the city.

Red Tulip, 439 E. 75 St., 734-4893. Another good Slavic restaurant, this time Hungarian specialties.

Rio de Janeiro, 41 W. 57 St., 935-1232. "Fascinating and well-prepared array of Brazilian and Portuguese food in a pleasant if banally commercial setting at moderate prices and with a staff so sincerely intent upon pleasing one is torn between laughing and crying."

Madras Woodlands, 310 E. 44 St., 986-0620. Strictly vegetarian restaurant, but the "ingenious combinations of flavors are more than enough to make up for the menu's vegetarian base."

at 43 St., 687-4940. Open pasta kitchen serving the finest clientele, according to one guidebook.

Regine's, 502 Park Ave. at 59 St., 826-0990. French cuisine served in ultimate after-dark, Paris-style restaurant and discotheque. Reservations required.

Schrafft's, 625 Madison between 58 and 59 and at 417 Fifth Ave. between 37 and 38 Sts. Traditional American cuisine.

Shah Abbas at the Waldorf-Astoria, 301 Park Ave., at 49 St., 751-9588. Lavish Iranian cuisine in opulent setting.

Shun Lee Dynasty, 900 Second Ave. at 48 St., 755-3900. Colorful Chinese restaurant serving Szechuan, Man-

darin and Hunan specialties.

Sparks Steak House, 210 E. 46 St., 687-4855. Listed as one of New York's best steak and lobster houses.

Toscana, 246 E. 54 St., corner Second Ave. 371-8144. Italian cuisine in small, chic, pristinely white room.

Trattoria, 45th St. in Pan Am Building, between Madison and Lexington Aves., 661-3090. Italian food in restaurant similar to trattorias in Italy. After-theater menu.

The Ultimate Lotus, 59 E. 56 St., 421-5580. Elegant establishment serving fine Mandarin and Szechuan food.

White Turkey, 260 Madison Ave. at 38 St., 685-1710. American cuisine from the early American name.



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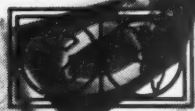
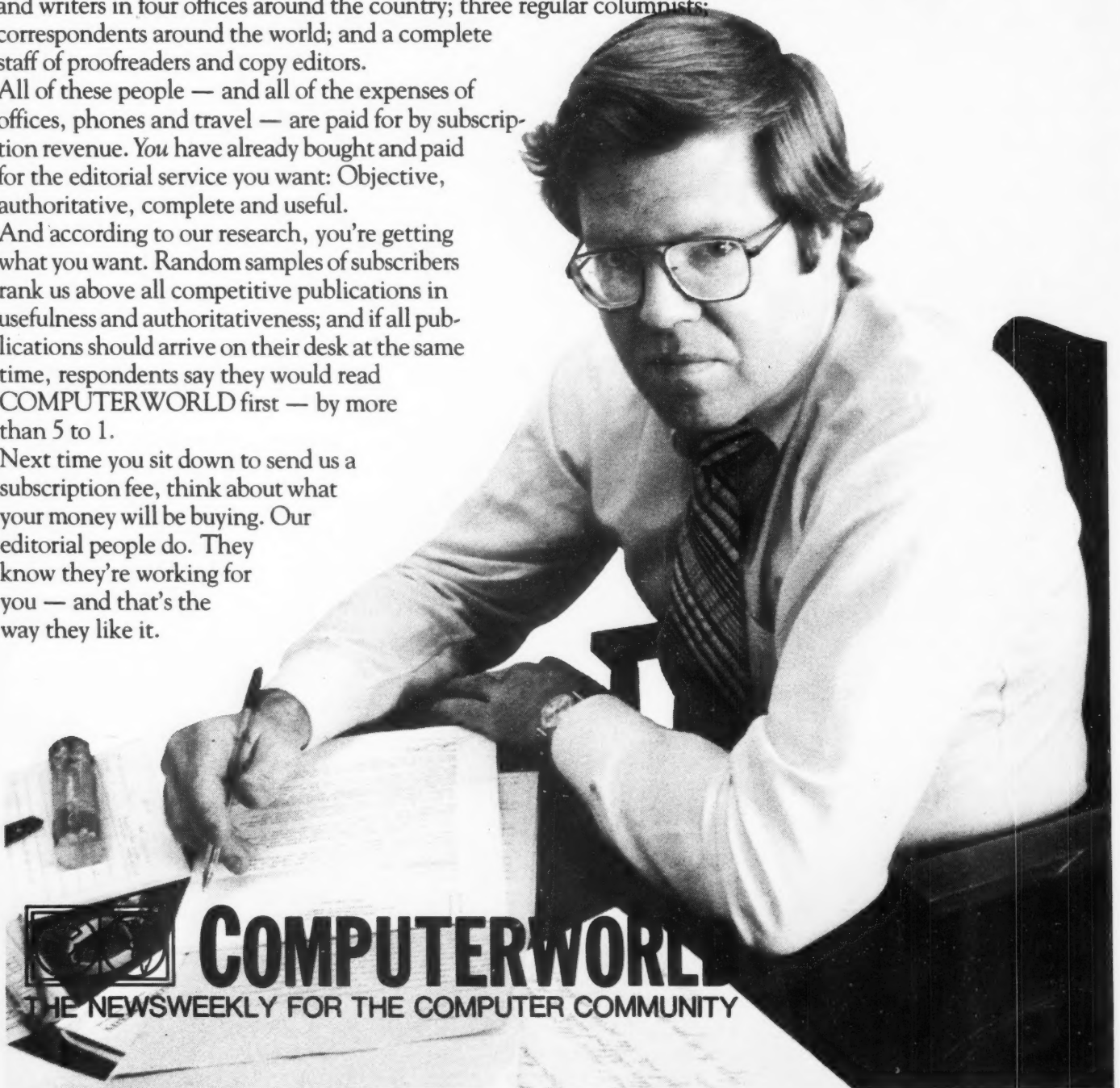
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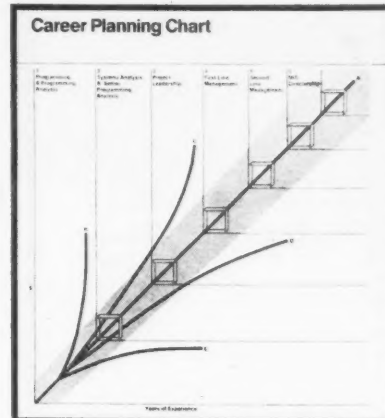
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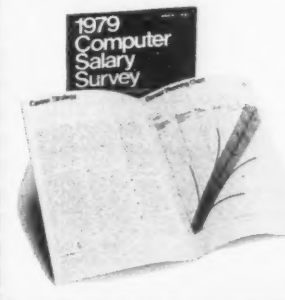
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Hartford	203/522-6590	Fort Worth	817/338-9300
New York	212/736-7445	Greensboro NC	919/294-6550
Long Island	516/222-2616	Houston	713/626-8705
White Plains NY	914/683-9300	New Orleans	504/561-6000
Paramus NJ	201/265-7456	Phoenix	602/258-9333
Philadelphia	215/665-1717	San Antonio	512/344-0217
Valley Forge PA	215/265-7250	West Coast	
Stratford CT	203/375-7240	Los Angeles	213/386-5500
Union NJ	201/687-8700	Encino CA	213/995-8866
Washington DC	703/790-5610	Irvine CA	714/833-1730
Midwest		Torrance CA	213/540-7500
Chicago	312/782-0857	Palo Alto	415/856-0600
Northfield IL	312/446-8395	Portland OR	503/223-6160
Oak Brook IL	312/986-0422	San Diego	714/231-1900
Rolling Meadows IL	312/392-0244	San Francisco	415/434-2410
Cincinnati	513/789-5080	Seattle	206/454-6400
Cleveland	216/771-2070	Canada	
Detroit	313/963-0510	Toronto	416/364-2919
Southfield MI	313/352-6520	If unable to call, write:	
Kansas City MO	816/474-3393	Source Edp, Department CA	
Milwaukee	414/277-0345	721 Enterprise	
Minneapolis	612/544-3600	Oak Brook, Illinois 60521	
Pittsburgh	412/261-6540	(When writing, please be sure to indicate	
St. Louis	314/862-3800	home address and current position title.)	
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PROGRAMMER/ANALYSTS

A research Institute at the Indiana University Medical Center (Indpls.) offers excellent opportunities for top people in two major areas of concentration with national significance:

- o Develop new kind of medical information system for micro-computer using PDP 11 RSTS, in BASIC PLUS. Includes in-house data base management system and medical decision-making system, with clinical lab, pharmacy and clinic operation modules. Strong user interaction and responsibility from design through implementation of system. Requires BS in Computer Science or equivalent technical degree and 1 to 3 years experience., RSTS, BASIC PLUS and/or RSX 11-M desirable.
- o Development of a general Computer Simulation language. Work involves language development, compiler design, and programming. Applications extend to medical decision making and health planning. Requirements are BS and/or MS in Computer Science or equivalent. Experience with discrete event simulation helpful.

Salary depends upon qualifications and experience. Please send resume (if possible, college transcript) to: Ms. Joanne Lepper, 1001 West 10th Street, Indianapolis, IN 46202.

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25 START-AT-HOME COMPUTER BUSINESSES

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SYSTEMS ANALYST

Develop online county based judicial information system. Position includes system analysis, design and implementation. Prefer 5 yrs. EDP experience with 2 yrs. systems design in Data Comm. Judicial and/or criminal justice information systems experience desirable. \$17,800 - \$21,600 depending on experience. Position begins July 1979. Send resume to Dean Ernst, Data Processing Manager, Linn County Courthouse, Cedar Rapids, Iowa 52401, phone (319) 398-3538. Equal Opportunity Employer.

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Expanding oil & gas company seeks experienced personnel having at least 1 1/2 yrs. experience in COBOL on IBM equipment.

Systems development will utilize IBM's VM/CMS facility with 3278 CRT's. Program development will support multiple locations in Texas and California. Hardware consists of a 370/148 2 MEG machine running OS/VS1.

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PROGRAMMERS & SYSTEMS ANALYSTS

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Experience with Fortran or UNIVAC 1100 series is desirable.

We offer highly competitive starting salaries commensurate with your background, plus a comprehensive fringe benefit program and excellent opportunities for personal satisfaction and professional growth.

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St. Paul, Minnesota 55165
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We are seeking a qualified, career-minded individual who has an extensive background in the micro mini-computer market, to learn to manage our Computer Center that is opening soon in this area.

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Radio Shack Computer Centers
A Division of Tandy Corporation
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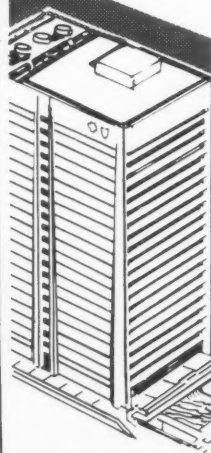
Chief Systems Programmers

Must have 3 or more years of IBM Systems Programming with experience in any or all of the following: IMS/VS, MVS, TCAM/TSO, VTAM/NCP, CICS, ASSEMBLER, PL/I, FORTRAN. Will be involved in the strategic planning and implementation of advanced IBM data communications systems; performance evaluation of IMS/VS DB/DC Systems; centralized DB/DC administration.

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Must have 1-3 years of applications programming and experience with OS or VS operating systems. Prefer 2 years of college plus experience with MVS operating systems and/or teleprocessing systems.

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SYSTEMS ANALYSTS

Pre/Post Sales Support

You will be responsible for providing pre and post sales support for an extensive line of intelligent/non-intelligent graphic terminals, systems, plotters and related peripherals. In addition you will be responsible for customer training. Scientific programming fluency is required.

SALES ENGINEERS

Microprocessor Design Labs

The sale of Microprocessor Design Labs, an emulator system that provides a complete procedure for integrating hardware and software in microprocessor based products, will be your responsibility area. Candidates should have current knowledge of digital hardware systems and assembly language experience.

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Successful candidates will have a proven record of sales management in the computer industry, with P/L responsibility, excellent numbers performance, and most importantly the ability to direct and motivate an active sales team.

SALES ENGINEERS

Interactive Computer Graphics

You will be responsible for the sale of an extensive line of intelligent and non-intelligent graphic terminals, systems, plotters and related peripherals to new and established customers. Previous sales experience of a year or more and knowledge of computer hardware is required.

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If you have ever worked in any of the following disciplines, we want to hear from you: Printers, plotters, photographic devices/processes, computer peripherals and related mechanisms.

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Product expansion and improvement necessitates experienced evaluation engineers. Microprocessors, graphics, automated test, digital logic and interactive operating systems are only a few of the areas we are developing.

SOFTWARE RELIABILITY ENGINEERS

Functioning as a consultant within the company, this person's goal will be aimed at designing the reliability into the system.

TECHNICAL WRITERS

Tektronix technical writers are part of the design team on each product. Software and/or hardware knowledge or experience is necessary.

IMAGING ENGINEERS & PHYSICISTS

Experience is required in researching and designing electrographic and/or ink jet imaging processes for novel hardcopy units.

HARDWARE RELIABILITY ENGINEERS

This position would be responsible for evaluating electronic components as well as complete electronic designs for reliability and safety standards.

AUTOMATIC TEST EQUIPMENT ENGINEERS

Accountable for test equipment design, including both hardware and software involving a wide range of products with analog and digital circuitry.

SENIOR HARDWARE ENGINEERS

Individuals functioning on this project would have responsibility for researching and designing high speed analog and digital sub-systems for data acquisition. Knowledge of signal processing and A/D conversion systems required.

MARKETING

MARKETING PRODUCT LINE MANAGER

Printers/Plotters

You will direct the marketing program for a successful line of graphic plotters. Experience in the technologies with BSEE/MBA preferred.

MARKETING PRODUCT LINE MANAGER

Graphic Terminals

Developing marketing strategies for a line of dynamic graphic terminals would be the responsibility for this person. Previous sales or product marketing experience and BSEE/MBA preferred.

MARKET DEVELOPMENT MANAGER

Software/Hardware

The creation of new markets for digital service products would be the challenge of this position. Extensive knowledge of software/hardware tradeoffs is required.

PRODUCT PLANNING SPECIALIST

Software

Previous experience in application software would be needed to support software marketing opportunities for our graphic computer products.

DATA PROCESSING

SYSTEMS ANALYSIS

Many openings exist for those who can apply advanced computer technology to design system architecture for business applications.

SENIOR PROGRAMMER ANALYSTS

Our need is for senior level individuals who can project lead in the design and development of business and commercial applications in an IBM, COBOL environment.

SYSTEMS PROGRAMMER

Knowledge of either DOS/VS, CICS or OS/MVS, IMS would be necessary for two large development projects currently in process.

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If we can't meet with you at NCC, we'd still like to explore with you these and other opportunities available throughout the country. Direct your resume to the relevant field or headquarters address.

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is a recognized professional firm engaged in providing engineering and construction management services. There is an expansion program underway to provide more comprehensive Data Processing capabilities. Currently we run a variety of scientific and commercial systems on an IBM 370/148 communicating with Four Phase minis as well as other processors. To support this configuration, we use OS/VS1 under VM/370, CICS, RTAM, CMS, Parvalet On-line, FORTRAN, MARK IV, COBOL and PL/I. Our philosophy is to extend computer technology to all phases of operations at MAIN and, accordingly, we are actively involved or planning involvement in the following areas:

- selection and implementation of a data base management system
- expanded data communications capabilities
- hardware selection and upgrades
- development of On-line business applications

SENIOR SYSTEMS PROGRAMMER

You must have solid Systems Programming experience, with knowledge of the structure and design of OS/VS operating systems. You should be familiar with advanced Assembly coding techniques and possess a knowledge of VS1 or VM internals, sysgens, OS/JCL, Standalone Dump debugging and various vendor software. Knowledge of CICS a definite plus.

SYSTEMS PROGRAMMER

You should have some Systems Programming experience with a strong Assembly Language background and knowledge of OS/JCL. Exposure to FORTRAN and/or COBOL a definite plus. Will consider trainees who possess the above qualifications and are able to work with minimal direction.

SENIOR SCIENTIFIC APPLICATIONS PROGRAMMER

Applicants should have a degree plus a strong working knowledge of FORTRAN; OS/370 experience preferred. The successful applicants will be exposed to a wide selection of projects involving both batch and/or interactive data processing operations.

PROJECT LEADERS

Total project responsibility for design and implementation of commercial applications. The ideal candidate would be a proven EDP professional with knowledge of COBOL and OS/JCL. A degree is preferred. Salary commensurate with experience.

ANALYST/PROGRAMMERS

Technical experience with COBOL and knowledge of OS/JCL necessary. Position requires a self-starter to be involved in design and maintenance of major business applications.

APPLICATION PROGRAMMERS

One year experience COBOL and exposure to business-oriented applications are required.

These are responsible positions, offering opportunities for career development with a progressive employee-owned engineering company.

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Will have a knowledge of and contacts in the New England area to market Raytheon's IBM 3033. This requires 3-5 years experience in marketing facility time for batch, remote batch and on-line services and applications software packages on large mainframes. 3033 experience is desirable. A proven sales record is a must.

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The candidate must have a first hand knowledge of the software sales and lease market in New England. This individual will have the opportunity to design his own product line starting with an inventory of available packages. You will direct a staff of skilled professionals who will maintain existing packages and develop custom packages for clients.

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RAYTHEON

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- Systems Programmer
- Systems Analyst
- Programmer Analyst
- Computer Operator

Previous work experience required for all areas. We operate the latest in equipment, the IBM 3033, MVS and COBOL/Assembler background required. Credit card experience helpful, but not necessary, as we are active in a large bank credit card application. Colorado National Bank offers an extensive benefit package, including pension plan and dental insurance. We would also help subsidize your moving expense to Denver.

Should you be interested in pursuing in a data processing career with one of the largest, growing financial institutions in Denver, please submit your resume to:

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Personnel Department
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PROGRAMMER/ANALYSTS

Informatics, the largest independent supplier of commercial software services, is seeking job oriented individuals who will become part of our professional staff of Data Processing Consultants.

Challenging opportunities are available now in our San Francisco, Los Angeles, Dallas and Seattle offices for professional Programmer/Analysts with at least 1 year of experience in one or more of the following areas:

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We have various positions for Electrical Engineers with computer science interest or Programmers with an interest in computer hardware to work with either the CYBER 200 Series or the CYBER 170 Series — some of the most powerful computer systems in the world. These systems utilize scalar and vector processing. Opportunities to utilize both your hardware and software aptitudes and interests are available in:

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- Positions involve:
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Assembly language background helpful. A BSEE, BSCS or equivalent plus a minimum of 1 year related experience is required. Experience in customer engineering, software applications development/support, operating systems development/support or manufacturing test would be helpful.

LOGIC DESIGNERS

Become a member of a team involved in the development of an advanced large scale computer system. Duties include state-of-the-art logic design and computer aided logic simulation. Advanced technologies such as subnanosecond, custom LSI arrays and state-of-the-art packaging techniques are being used. We require a BSEE and a minimum of 2 years experience in design or test.

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Control Data Corporation is currently organizing and staffing a CAD/CAM Systems Division. This division is responsible for the development and production of application software related to computer aided design and manufacturing. Immediate openings exist for:

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Sue Summerfield
Control Data Corporation
4201 Lexington Avenue North
St. Paul, Minnesota 55112
(612) 482-3140

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The available positions will be working with Control Data's large scale CYBER 171 through CYBER 176 Computers and the CYBER 203 Supercomputer.

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- Operating systems development
- Operating systems integration and evaluation (testing)

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Display your expertise as Manager of software support for Mass Storage Systems software products. This position has worldwide responsibility for central field support and resolution of customer reported problems. Position includes responsibility for multiple projects, supervision of 10-12 systems programmers, high degree of customer contact, and light travel. Qualifications include previous managerial experience, a technical background in IBM Assembler Language, OS/VS operating systems, and systems programming experience.

SYSTEMS PROGRAMMER

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SYSTEMS PROGRAMMER

Gain technical and career growth in a state-of-the-art development organization utilizing multiple IBM operating systems. Perform detailed program design and implementation for a sophisticated system task running under MVT, SVS, VSI and MVS. Applicants should have 2 plus years assembler coding experience, a strong knowledge of JCL, utilities, operating system concepts, and 1 plus years IBM systems programming experience. Additionally desirable assets are experience with TSO, CMS (UM), and structured programming techniques.

SYSTEMS PROGRAMMER

Utilize your experience in the MSS software test group. Be responsible for test design, test development and test execution. Responsibilities also include modification of existing tests, analysis of test results and participation in formal reporting of test results. Incumbent should have internal knowledge of one or more of the following operating systems: MVS, SVS, VSI. Computer performance evaluation experience is also desirable.

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Sue Smith
Control Data Corporation
2200 Berkshire Lane
Minneapolis, Minnesota 55441
(612) 553-4720

Manager System Services

Blue Cross, a progressive, non-profit health insurance organization, has a management position currently available for an individual with 8-10 years experience in programming, with experience in software programming and data base administration including four years in heavy management capacity. Must possess BA/BS in computer science, business administration, math or equivalent.

The successful candidate will be responsible for managing the Systems Services Department, including Data Base Administration, Systems Programming and Documentation and Standards sections in a multiple CPU environment (IBM 370/168 and Amdahl V5 - 8 meg each) under OS/MVS with IMS DB/DC.

The successful candidate must possess in-depth knowledge of data base/data communication control programs, networks and applications, operating systems and documentation and standards.

We offer excellent salary and benefits. If qualified, please send resume with salary history to **Jose Garay**, Professional Employment, Dept., 1950 Franklin Street, Oakland, CA 94659. Or call collect (415) 845-3011.

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MANAGER OF DATA PROCESSING

We are a dynamic, expanding manufacturer of metal products located in the mid-Ohio Valley with an excellent career opportunity for an individual in our small, growing Data Processing department.

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Due to the size of the department (2 people) the individual we select will have a unique opportunity to shape its impact upon our company. As a result, the successful candidate must be a "hands-on," shirt-sleeve type person who will be flexible enough to cover all facets of the data processing function. We require a minimum of 3-5 years experience with small-scale IBM systems and the ability to interact with people on differing levels in our organization, as well as a good working knowledge of RPG II.

We offer an excellent compensation package, including a salary commensurate with experience and ability, and above all, the chance to grow along with us. For consideration, please submit your resume, including salary history, to:

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Data Processing Manager

Medium sized installation in Southeastern Wisconsin seeking bachelor's degree D.P. Manager with extensive systems, COBOL and management background. Burroughs hardware experience a plus. Attractive salary and excellent fringe benefits. Send resume to Kenneth Niemeyer, 1001 South Main Street, Racine, WI. 53403.

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Vice President MIS \$70,000

Major manufacturing company located in Southern California seeks seasoned DP executive to give strong direction to corporate systems group. Ideal candidate will have at least 12 years' successful experience in manufacturing systems design and implementation in job shop environment. Send resume and salary history in confidence to:

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SYSTEMS PROGRAMMERS**Rensselaer Polytechnic Institute**

Rensselaer Polytechnic Institute, in upstate New York, is looking for outstanding individuals to help support and enhance an IBM 3033-based 300-terminal time-sharing network. Expertise is required in at least one of the following areas: system performance evaluation, compiler development, graphics software, or operating system improvements. Applicants should be thoroughly familiar with one of MVS, VM, or MTS. Salary open depending on background. Send resume and three references to: Manager of Recruitment, Rensselaer Polytechnic Institute, Troy, New York, 12181.

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A B.S. or M.S. in Computer Science or an allied area with knowledge of computer technology, software systems, data structures, and systems analysis are required. Experience in the area of computer graphics applications to real-world technical problems is desired.

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Software Engineer/Telecommunications

Working in our leading digital signal processing group, you will develop algorithms and software support for signal processing devices. Requires BS/EE or Computer Science or equivalent with MS desirable plus a minimum of 3 years' experience utilizing 1 or more high level languages, preferably with exposure to digital signal processing devices. Please send your resume to Dennis Williams.

Senior Sales Systems Analyst

You will initially be responsible to design and install a distribution inventory tracking and sales activity system, including coordinating this system with our order entry and sales system. You will interact with Marketing and other groups such as Finance, and will receive support from the Corporate Information Services group. Requires BS Computer Science or equivalent plus 4 years' experience with business or related computer systems. Please send your resume to Dennis Williams.

Senior Systems Programmer/Analyst

As part of our industry leading Quality & Reliability Engineering group, you will develop and work to maintain user-oriented systems, as well as provide programming support for their minicomputer. You will also interface and receive support from the Corporate Information Services group. Requires BS/Computer Science, Math, or equivalent with 3 years' experience combining systems programming and systems analysis, including knowledge of a high level language and preferably some data-base management. Please send your resume to Dennis Williams.

Staff Systems Consultant

You will design and implement engineering communications network and related software. You will be actively involved with engineering software development, providing technical consulting on engineering systems, communications network architecture, and insuring viability of the engineering communications network. Prefer 3-5 years' experience with communications related software in a DEC Systems-10 computer environment with MS Computer Science or equivalent. Please send your resume to Peg Wynn.

Senior Systems Programmers

You will provide technical expertise in the areas of data communications and software maintenance for the DEC Systems-10 time-sharing system using a TOPS-10 operating system. Requires a minimum of 3 years' experience in programming, preferably with DEC Systems-10 expertise. BS Computer Science preferred. Please send your resume to Peg Wynn.

Please send your resume to Intel Corporation, Dept. 22AC, P.O. Box 3078, Santa Clara, CA 95051. Please refer to the appropriate individual listed with each job description. An equal opportunity employer m/t/h.

In addition to the above openings, we have a variety of software development and management information systems opportunities available. So, if you're attending the National Computer Conference, stop by and see our employment representatives to discuss career opportunities at Intel.

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Senior Data Communications Specialist—A BS or MS in Electrical Engineering is a start; experience with VM/370, Bismark, 3705EP, X-25, etc. is valuable. Mini or micro programming is a plus. For a real technical professional, salary in low or mid-20's. Contact Richard Alexander.

In either position you will work with a top technical staff at the computer center, and the broad range of intellectual and cultural activities of the University will be available.

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Cornell University is located in Ithaca, a small city in the Finger Lakes area of upstate New York. Freedom from Urban smog and congestion combines with a stimulating intellectual community. Cultural activities and recreational facilities are plentiful. Send a resume or call: Computer Services, Langmuir Lab, Cornell Research Park, Ithaca, New York, 14850, (607) 256-3747. An Equal Opportunity Employer.

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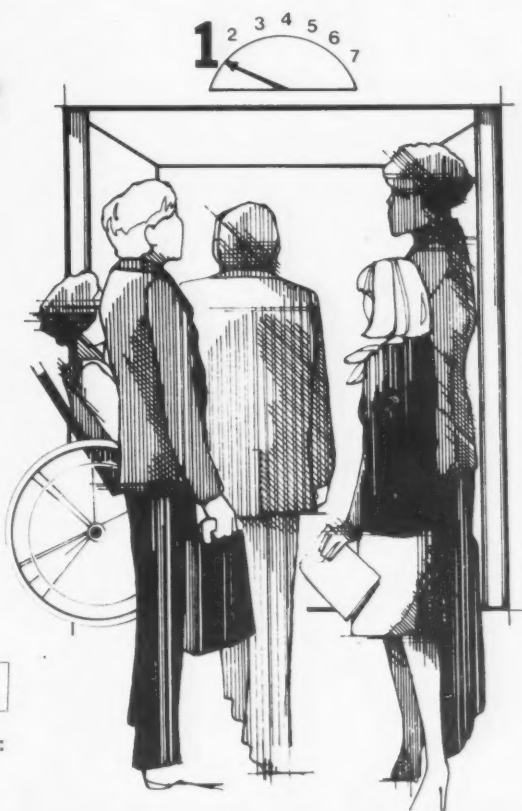
If you're looking for a place where you can elevate your career, now's the time to explore Codex. And take this ground floor opportunity straight to the top.

Currently we need qualified individuals with front-end processor experience in the following:

- Sales Representatives
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Look us up at the National Computer Conference, June 4-7 in New York City.

Please send your resume and salary history, in confidence, to: Gary Davis, Codex Corporation, 20 Cabot Boulevard, Mansfield, MA 02048.



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Experience required in one or more of the following areas: COBOL (ANS, ASC preferred), communications, mini-systems, manufacturing and financial applications. UNIVAC hardware experience desirable.

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EDP OPERATIONS CONSULTANT: DECsystem 10 Software specialist for a KI-10, KL-10 installation. Minimum of one year experience in installing and maintaining TOPS-10 monitors on either KI's or KL's. Prefer familiarity with PDP 11 operating systems. In addition, responsible for: DECsystem 10, monitor installation and maintenance; System performance analysis; Evaluation of new and existing system hardware and software; Consultant to applications programmers on design and optimization.

As a leader in the minicomputer industry, we can offer very competitive salaries, outstanding benefits, and a flexible work environment. For immediate consideration please send your resume to: Garry Strop, Digital Equipment Corporation, 2500 West Union Hills Drive, Phoenix, Arizona, 85027. We are an equal opportunity employer, m/f.

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Analyst I (anticipated) — Minimum requirements, a college degree (or equivalent experience) in an area relating to data processing.

If you are qualified for any of the above positions, please send your resume and salary requirements to:

Dr. John M. Tyler, System Network Computer Center
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We require a solid technical software or hardware background in mainframes, minis or systems preferably in a marketing environment. The ability to open up new end user or OEM accounts is a must.

We currently have immediate openings throughout the country. To find out more about these positions contact the regional recruiters listed below (either call collect or send your resume including salary history).

- New England: Joan Vasilopoulos (617) 235-8171, 888 Worcester Rd., Wellesley, MA 02181.
Cambridge and Wellesley, MA; Rhode Island; Connecticut; and New Hampshire.
- Mid Atlantic: Jim O'Sullivan (212) 557-1122, 144 East 44th St., New York, NY 10017.
New York City, Melville, L.I., Albany and Westchester, NY; Philadelphia, PA; and Somerset, NJ.
- Federal: DC/MD/VA: Maury Shyne (703) 827-9600, 1757 Old Meadow Rd., McLean, VA 22101.
Washington, D.C.
- Midwest: Joe Elias (312) 364-3000, 703 West Algonquin Rd., Arlington Heights, IL 60005.
St. Louis, MO; Milwaukee, WI; Detroit, MI; Indianapolis, IN; Columbus, OH; Chicago, IL.
- South: Rich Brown (404) 448-6072, 6855 Jimmy Carter Blvd., Suite 220, Norcross, GA 30071.
Houston, Dallas and Austin, TX; Nashville and Knoxville, TN; Huntsville, NC; Baton Rouge, LA; and Oklahoma City, OK.
- Southwest: Chuck Milleman (415) 856-6060, 2445 Faber Place, Palo Alto, CA 94303.
El Segundo, Van Nuys, Santa Barbara, Pasadena, Santa Ana, Anaheim, Los Angeles and San Diego, CA; Phoenix and Tucson, AZ; Albuquerque, NM; and El Paso, TX.
- Northwest: Chuck Milleman (415) 856-6060, 2445 Faber Place, Palo Alto, CA 94303.
Palo Alto and San Francisco, CA; Denver, CO; and Seattle, WA.
- Canada: Dale Malpass (416) 259-4271, 415 Horner Ave., Toronto, Canada. M8W4W3
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SENIOR PROGRAMMER/ ANALYST

Position reports to Systems Manager and will involve installation and operation of IBM (370) /4331 on-line system and on-going systems expansion. Experience in DOS/VS, CICS, COBOL, and/or RPG II.

Initial responsibilities will be to assist in conversion from IBM SYS/3 Mod 12 Batch to (370) /4331 on-line system.

Send resume and salary history to:
Attention: Systems Manager

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Data Communications Writers

Our Corporate Headquarters' Technical Publications Department has several positions for qualified writers experienced in data communications documentation. Projects include researching, organizing, and writing communications-related users' manuals, systems analysts' manuals, and data sheets for Wang's Word Processor Systems, Office Information Systems, and Computer Systems.

Candidates should have two or more years technical writing experience with concentration in one or more of the following areas: BSC protocols (including 2780, 3780, 3741, or 3270), SDLC, or SNA. Bachelor's degree required; advanced degree a plus.

These positions offer career opportunities at Wang. We emphasize high quality documentation and provide an excellent working environment with complete hardware/software accessibility. Competitive salary and excellent benefits package. Please submit your resume, including salary requirements, to Linda G. O'Connor, Wang Laboratories, Inc., One Industrial Avenue, Lowell, MA 01851.

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To assist Information Systems/EDP Manager and major national software development firm in conversion from RJE to in house HP-3000 Series III computer for full range of financial systems and development of manufacturing systems. High visibility exposure to top level division management and California corporate IS/EDP staff management.

Requires expert ability in ANS COBOL. Knowledge of RPG II and Basic Assembler Programming languages and DOS preferred.

Should have knowledge of DP applications in some or all of these areas: cost and general accounting, production and manufacturing control sales and marketing and product and industrial engineering. Qualifications includes BS, BA or BBA.



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• Assembly language and OS

Work on ROSCOE, our online program development system for OS. Work is in progress or planned in 1) secure operating environments; 2) problem-solving, interactive languages; 3) enhanced man/machine interface; 4) distributed processing. Requires several years of Assembly language experience. Call Alan Polk.

• DOS/VS software development

Assist in the design and implementation of performance measurement tools for DOS/VS. Requires Assembly language and knowledge of DOS/VS internals. Familiarity with performance measurement helpful. Minimum two year's experience and/or college degree preferred. Call Philip J. Berg.

• Online systems and display terminals

Assist in the design and implementation of an online program development/generation system. Requires familiarity with commercial applications, data base concepts and language processors (compilers, interpreters, and query languages). Programming experience with display terminals and/or a CS degree preferred. Call Adam Rin.

• Assembly language, MVS and VSAM

Assist in the design and implementation of a source management system for online and batch access. Requires several years of Assembly language experience and familiarity with VSAM and MVS internals. Knowledge of data base concepts and/or a CS degree preferred. Call Ralph V. J. Lanni.

SUPPORT POSITIONS ALSO AVAILABLE

We are also looking for talented people to fill a variety of support and documentation positions. Please call Ed Smith, Personnel Director, for more information on any of these openings.

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Train new customers in the use of our generalized pre-compiler for COBOL applications development and maintenance. Provide telephone and on-site technical support. Requires experience with COBOL programming and commercial business applications. Experience with structured programming methods, data base applications and Assembly language preferred. Good communication skills essential. Traveling required.

• The LIBRARIAN

Assist customers in the use of our source program management system. With the development staff, take part in the analysis and solution of reported problems. Requires experience with DOS/VS Assembly language and knowledge of DOS/VS JCL and POWER/VS JECL.

• LOOK

Aid customers and ADR field representatives in the use of our performance measurement product line. Good communication skills essential. Some familiarity with OS and/or DOS internals highly desirable. Light travel.

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Present the MetaCOBOL Product Group to new prospects. Requires COBOL programming and commercial applications experience. Good communication skills essential. Traveling required.

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General Electric Information Services is planning a remote computing environment focused ten years ahead.

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General Electric Information Services already provides sophisticated data management services to over 5,000 businesses around the world. Our single-source approach—integrating host computers, teleprocessing networks, intelligent terminals, software, training and service—has made us one of the world's leading companies in computing services.

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What you already know about the architec-

ture of MVS in interactive data base systems is obviously important.

But that's just the starting point for a creative jump into the future. A future that must, in a few years, make you a top world authority on efficient, cost-effective remote computing systems.

In addition to a career advancement opportunity probably unmatched anywhere, we offer excellent salaries and employee benefits. Plus the advantages of a pleasant suburban working environment in Rockville, Maryland.

If you are confident of your ability to meet this unique challenge, we invite you to send your resume and salary history to: Employee Relations, General Electric Information Services Company, 401 N. Washington St., Rockville, Md. 20850.

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Want To Break Into Data Base?

We're seeking experienced systems programmers who want a new challenge. You've worked on operating systems or compilers or utilities, and now you're ready to apply your talents to an area that offers growth in a stimulating environment.

At Wang Labs, we have the unorthodox view that Data Base design and implementation requires strong systems software professionals who understand operating systems, languages, and utilities.

While we won't hold it against you if you also understand Data Base, we know that the same skills that made you successful in OS or compiler development are necessary for successful DBMS implementation. We are building a new product—one where our end users may not know where OS leaves off and DBMS begins. So if you don't mind blurring that boundary, neither will we.

We have work in DBMS internals, access methods, locking protocol, recovery, deadlock detection, transaction processing. We need utility designers to work on our data dictionary and directory facilities. And we want language people to help build exciting new Query and Report writers for our data base.

If you've had 2-6 years of solid experience in systems programming and design and you'd like to help us build a new integrated data base product, send your resume with salary history to Elaine F. Rosenberg, Professional Recruiting, Wang Laboratories, Inc., One Industrial Avenue, Lowell, MA 01851.

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(717) 346-2233

**SYSTEMS ENGINEERS
(FIELD ENGINEERING,
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ANALYSTS
PROGRAMMERS**

Virginia Tech, located in the mountains of Southwest Va., has career opportunities in these areas. Good State benefits with educational opportunities available. University Computer Resources include IBM 370/158's with MVS/IMS, and VM/CMS; Honeywell MULTICS system; and a large variety of mini and micro computers. Contact Robin Ball, Personnel Office, 324 Burruss, VPI & SU, Blacksburg, Va 24061 (703) 961-5301. An Equal Opportunity/Affirmative Action Employer.



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Major expansion and upgrading of our current IBM 370 hardware to Virtual Storage Operating Systems, data base/ data communications, and distributed processing applications, has created opportunity for experienced professionals seeking challenging and progressive long-term careers.

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One to three years experience in COBOL, JCL, in an OS environment. College degree preferred.

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Minimum four years experience in a manufacturing environment with heavy user interface and above average analytical and communication skills. College degree preferred.

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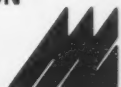
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Our computer services department in San Francisco has openings for engineers and analysts with experience in designing, installing, and maintaining data communications networks in an IBM environment. Responsibilities include: Planning and design of data communication systems, analysis of data communications hardware, software, and networks, coordination of systems installation, solving data communications problems and troubleshooting data communications networks. If you are looking for a challenging opportunity with growth potential in a fast growing area, please send your resume with salary history and requirements to:

Standard Oil Company of California
Professional Employment Office
P.O. Box 3495
San Francisco, CA 94119



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Minimal requirements will be at least 2 years experience in large scale systems, with particular emphasis on IBM-370 equipment along with OS-JCL, TSO and PL1. Degree in Computer Science, Math or suitable scientific discipline will also be essential. Specific experience with medical or laboratory systems and a facility in FORTRAN and INQUIRE would be desirable.

This appointment, we feel, has a lot to offer the right person. You'll like our benefits too. Please send resume to: **Manager of Scientific Employment, Schering-Plough Corporation, 60 Orange Street, Bloomfield, New Jersey 07003.**



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Data Base/Operating System Programmer/Analyst SALT LAKE CITY

We are a major intermountain area manufacturer of on-line, real-time computer control systems for industrial control systems and are seeking two highly motivated individuals to share our growth; one to help us with DBMS development and maintenance, another to help with operating system maintenance.

The DBMS position requires experience in file handling techniques using minicomputers, preferably DEC PDP-11. A degree and two to five years experience are required; Data Base experience will be helpful.

The operating system position requires experience in system procedures and operating system fundamentals, including device driver and file handling routines using mini-computers, preferably DEC PDP-11 under RSX-11M. A degree and three to six years experience are required. We are an equal opportunity employer.

Send resume and salary history to:

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David George, Mgr. Industrial Relations
525 West 350 North Bountiful, Utah 84010

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We're a fast growing major force in the Data Communications industry with a wide product line including low, medium and high speed Modems, Time Division Multiplexers, Statistical Multiplexers and Network Diagnostic and Control Systems.

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- Manage product phase-in
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- Assemble price list cost info
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Successful applicants will have a technical degree; experience in sales and/or product management; an in-depth knowledge of data communications; and an ability to work independently as well as with engineering and manufacturing management. Specific concentrators/multiplexers highly desirable. These highly visible positions offer excellent salaries and growth opportunities.

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at the New York Coliseum June 4-7**

Qualified candidates should forward resume with salary history and requirements, indicating position desired, in strict confidence to: Mr. George Stevenson.



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One Kennedy Avenue
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203-797-0711

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SYSTEMS PROGRAMMERS IBM OS/VS1/MVS

Tired of sending resumes? We invite you, then, to pick up the phone and talk with another EDP professional.

Our MIS organization is experiencing dynamic growth in both personnel and equipment. Currently, our computer installation consists of an IBM 370-158 with 3330 and 3350 disk drives. Our plans call for continued expansion of this system, and during the summer we will be upgrading our hardware to a 370-168. Because of this, we are interested in talking with candidates who are interested in growth, too. If you possess a minimum of 4-6 years of IBM OS/VS1/MVS experience and a working knowledge of IBM's basic assembler language, you may be the person we are searching for. Additional requirements include familiarity with either PL-1 or COBOL, and strong organizational and communication skills.

Responsibilities include the specification and support of systems software; the development of backup and recovery procedures in a new processor installation; and the optimization of the processing environment through the use of proprietary software packages and through operating system tuning.

If you enjoy challenge and visibility in a position offering excellent growth potential, we invite you to call: **Guy Coniglio, Manager, Technical Support, at 716-338-6063** and talk to him about your future. If you prefer, send your resume, including salary history, in confidence to him at:

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Las Vegas, NV 89114

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Programmer Analysts Publications Specialists



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We're the fast-expanding domestic marketing, sales and customer support division of the world's second largest computer company. And we need additional analysts and technical writers with the ambition and qualifications to write their own tickets to success.

You'll be working in an environment that fosters professional growth, and be a contributing member of a state-of-the-art team that's regularly breaking new ground in application systems.

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■ **Publications Specialists:** Positions require BS in Computer Science or Business with solid technical background in EDP programming, and superior writing and communications abilities. You'll research, write and maintain technical publications documenting and describing new systems which are continually being released. Openings in Atlanta, Ga., and Dayton.

For a detailed briefing on your future at NCR, and a description of our comprehensive benefits package which includes generous relocation assistance to a fine, well-balanced community, call Tom Snow toll free at: 800-543-2386. In Ohio, call him collect at (513) 449-4150.

Or send your resume and salary history, in complete confidence, to him at: USDPG, NCR Corporation, Dept. F50, Dayton, Ohio 45479.

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Expanding service company seeking several qualified individuals to maintain and develop new applications in our San Francisco and New Jersey locations

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Edison State Community College is seeking a Coordinator of Data Processing to manage the computer operation, academic programs, and the entire administrative data processing system. Edison State is a growing 2100 student two-year college with new and expanding facilities.

The applicant should have at least five years of data processing experience with small or medium scale systems (DEC 11/34, 11/70) and should have at least two years of high level management experience in all aspects of college records systems. It is essential that the applicant have excellent oral and written communications skills. Exposure to community college environment is desirable. The applicant should be familiar with BASIC, COBOL, FORTRAN, RPG II, and the RSTS/E operating system. Applicants with a master's degree in a computer related discipline, or equivalent experience are preferred. Salary is competitive with excellent benefits.

Deadline for applications: June 18, 1979. Direct inquiries to:

Mr. Roger C. McGee
Dir. of Business Services
Edison State
Community College
1974 Edison Drive
Piqua, OH 45356
(513) 778-8600, Ext. 203



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Requires a Bachelor's degree, 7-8 years experience as an information systems professional, a proven track record in technical systems and applications, and good communication skills.

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Requires a Bachelor's degree and several years experience in all phases of the systems development process. Must have working knowledge of finance and accounting, and be able to communicate effectively with systems users.

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This position requires experience in the generation and maintenance of operating systems and supporting software products. Experience in DOS/VS, CICS/VS, and VM/370 is desirable. Candidate should have the ability to communicate with the staff in the evaluation of design alternatives and the resolution of problems.

These challenging positions offer unusual opportunities for growth in a company which has a significant track record of successful and profitable growth over the last 7 years. We offer competitive salaries and benefits and a first rate working environment and a chance to build a long-term career. Please send resume with salary history to Nancy Leutert.



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Our clients are primarily first-time EDP users or are in the process of evaluating data processing alternatives. Our consultants are involved in all phases of data processing, including system definition and design, feasibility studies, systems implementation, and the review of internal controls.

We offer a stimulating, professional environment where individual talents are recognized and encouraged. If you are interested in a challenging position with a high degree of visibility, together with an excellent compensation package, send your resume in confidence to:

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Be responsible for coordinating marketing, engineering and sales activities related to QUME's product line. You will interface heavily with Quality Assurance, Engineering and Manufacturing on product management activities.

Your broad scope of responsibilities will also encompass market analyses, pricing analyses, formulation of marketing plans and strategies, promotional activities, sales training and support to new account development involving special product pricing.

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Outstanding opportunity for highly motivated Sales Professionals to expand QUME's sales efforts. You must have direct OEM peripheral sales experience and excel in new business development. Attractive salary plus commission. Some travel involved.

Candidates for all the above positions should have a BS/BA Marketing (or equivalent) and at least 4-6 years experience in Sales, Marketing, Planning and/or Market Research in the areas of word processing, data processing or office systems. Strong analytical and interpersonal skills are essential. All of the above opportunities (except Sales Representatives) will be in our new Corporate Headquarters in San Jose.

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or call (312) 325-7660
or wire TLX 20-6285

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This is a senior administrative position with responsibility for computer services (ITEL AS-6) for State University of New York at Binghamton and a network of other State University of New York institutions. Computing services include academic research applications, instructional support, administrative data processing systems and a regional teleprocessing network. Qualification: Demonstrated managerial capability, planning and budgeting expertise, a thorough knowledge of hardware, software, applications and a commitment to user service. Academic or research experience desired. Salary negotiable. Application deadline: June 8, 1979. Send resume or nominations to:

Search Committee,
Computer Center Director
c/o Mr. Dean S. Nye
The State Univ. of N.Y.
Binghamton, N.Y. 13901
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Auburn University at Montgomery, Montgomery, Alabama 36117. Duties include supervision of computer facilities for academic and administrative users. Equipment includes terminals to HP 2000 and an IBM 1130, both as in-house processor and RJE terminals to an IBM 370/158. Prefer Masters degree in Information Systems or comparable work experience. Salary competitive. Position available immediately. Contact Dr. W. D. Clark, Dean, School of Business, Auburn University at Montgomery, Montgomery, Alabama 36117. Applications will be accepted until June 30, 1979. An equal opportunity employer.

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- Assessing the operational efficiency, management practices, and organizational effectiveness of data processing installations. Applicants for these positions should have experience in EDP management, EDP auditing, or EDP management consulting.
- Performing capacity planning studies, which include workload requirements analysis, configuration sizing and communications network design and evaluation, and providing ADP procurement assistance in such areas as benchmark design, specifications development, proposal evaluation and life-cycle planning. Applicants for these positions should have experience with hardware and software evaluation and with computer and/or communications system modeling techniques.
- Assessing the design and predicting the performance of special purpose computer systems, and analyzing the overall performance of complex systems that contain computers as integral subsystems. Applicants for these positions must be knowledgeable in Operations Research techniques, computer operating systems, and discrete-event simulation languages.

Salaries range from \$15,090 to \$30,750 with excellent opportunity for management responsibility. Advanced degree desired. Send resume of qualifications and salary history to:

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Washington, D.C. 20330
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This position calls for 3-7 years' experience including in-depth knowledge of financial and manufacturing applications. Minicomputer and real-time experience considered a definite plus.

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These positions require 1-5 years' experience designing and/or programming financial and manufacturing applications in an interactive minicomputer environment. HP-3000 experience is highly desirable.

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Dr. Philip A. Houle
Drake University
Des Moines, Ia. 50311
AA/EEO

Programmer-Europe

Luxembourg - IBM 370/158 MVS Control System ASSEMBLER, PL/I, Fortran Program for Language Translation System; database interfaces; dictionary maintenance. Minimum period - one year. Salary open. Send resume to:

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Please send confidential resume and salary history to: Mr. Ken Uhlig, Engineering and Manufacturing, NCR Corporation, Department F50, 3325 Platt Spring Road, West Columbia, S.C. 29169.

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San Francisco Peninsula

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- DATA BASE MANAGEMENT SYSTEMS

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Electrical Engineers Computer Scientists:

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- Tactical C³ Systems
- Analysis of Large-Scale C³ Systems
- Software Acquisition and Acquisition Methods
- Secure Computer Systems
- Computer Communication Systems

Most positions require an advanced degree, but a Bachelor's degree will be considered if you have relevant experience.

NEW YORK CITY INTERVIEWS AT NCC

While you're in New York, call Jerome McKinnon at (212) 586-7000 anytime after 1:00 PM on Wednesday, June 6 or anytime Thursday, June 7, to set up a conference of your own.

If you prefer, send your resume to his attention at The MITRE Corporation, 3805 Middlesex Turnpike, Bedford, MA 01730.

THE MITRE CORPORATION

MITRE is an equal opportunity employer actively seeking applications under its Affirmative Action program.

Manager, Information Systems

Permanent position with financially able organization with growth record since 1924. Requires strong technical and programming background and willingness to utilize technical and management skills. Qualify now and coordinate initiation of new DEC 11/70 in-house on-line system. Start \$30K plus major benefits. Call (213) 723-7191, Ext. 201 (Debbie Maslyn) for telephone discussion and interview appointment.

Immediate Opening For:

Business Programmers Tucson, Arizona

If you have 1 or 2 years of business programming experience, Tucson Electric Power may have just the position you are seeking! Requirements include: current knowledge of COBOL, IBM assembly language, OS/VS/JCL and CICS. Experience with IBM 360 or larger is most desirable.

In addition to the competitive salary and excellent benefit package, we offer even more with the sunshine and beauty of the Southwest. Send your resume to: Personnel Director, P.O. Box 711, Tucson, Arizona 85719.

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PROGRAMMER ANALYSTS

Jacuzzi Bros., Inc. is a leader and growth oriented manufacturer of water pumping and filtration equipment, air compressors, marine jet propulsion systems and gas grills with corporate headquarters in Little Rock, Arkansas. Corporate growth and recent hardware upgrade necessitates our search for several talented professionals who seek advancement and recognition as Programmer/Analysts.

Join this expanding team now, and you will be involved in the growth of many new marketing, manufacturing and financial systems planned for the next 5 years.

Individuals we seek must possess a minimum of 2 years college or equivalent and prior COBOL experience. Responsibilities will include analysis, design and development of on-line and integrated manufacturing systems.

This position offers competitive starting salary, liberal relocation allowance and excellent fringe benefits.

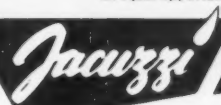
Arkansas is well-known for its hunting, fishing, camping, boating and other outside activities associated with the pollution free Southwest climate.

Please forward a resume with salary history in complete confidence to:

JACUZZI BROS., INC.

11511 New Benton Hwy,
Little Rock, AR 72203

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You don't have to live in the city to continue your data processing career.

Ritchie Industries, Inc. is located in Conrad, "The Black Dirt Capitol of the World," a community of 1,000 in Central Iowa. If you want to walk to work, Conrad is complete with all necessary services. If you would prefer the larger community, cities from 3,000 to 35,000 are within 15 miles.

We are looking for a qualified individual to assist in continued development of online and batch manufacturing and accounting systems, including: IPICS, MRP and production control installation of a S/38 in December, 1979; online support for IPICS, implementation of MAPICS Modules in 1981.

The successful candidate would have two years of programming, and/or one year of programmer/analyst experience on an IBM S/3 or S/34. CCP and manufacturing experience a plus.

Send resume, including salary history and requirements to:

Data Processing Manager
Ritchie Industries, Inc.
120 S. Main
Conrad, Iowa 50621
515-366-2525

Pittsburg State University

DIRECTOR OF MIS

The University seeks a Director of Management Information Systems to serve under the Office of Vice President for Administration. The University is engaged in an extensive study of existing management information systems components including all administrative data processing, hardware and software configurations, staffing and funding requirements, system development needs and implementations. The Director will play a key role in the planning, evaluation, and coordination of MIS system developments.

Candidate must have a Master's degree in business, computer science, or related field with 3 years experience at the managerial level in the planning and evaluation of management information systems. Salary dependent upon qualifications and experience.

Appointment date is August 20, 1979. Send letter of application and resume by June 30, 1979, to: Chairperson, Search Committee, c/o Office of Vice President for Administration, Pittsburg State Univ., Pittsburg, Kansas 66762. an aa/ee.

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PROGRAMMERS/ANALYSTS

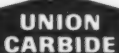
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As a result of our expansion, RDS' Minicomputer Operation has recently relocated to a new, modern facility in Mansfield, Massachusetts. Mansfield is located within a suburban, pastoral setting, halfway between Boston and Providence, Rhode Island, offering you easy access to both the cultural and recreational resources of the New England area.

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Computer Partners is seeking senior data base designers with in-depth understanding of IMS to perform consulting engagements and support educational services. Selected candidates will possess excellent written and verbal communication skills, and will have demonstrated abilities in IMS data base design and implementation.

Computer Partners offers unique opportunities for qualified professionals to join a young consulting organization and share in the success of their company through profit sharing and partnership participation. Openings are available in both our Boston and Chicago offices. If you would like to explore these opportunities in complete confidence, please call or write:

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Positions are available in these states immediately. (Other states are also available.)

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Positions involve sales of our new series of smart and intelligent video terminals to Dealer, OEM and End-User accounts. We require a strong background in peripheral sales with experience preferred in the sale of video and printer terminals. In return, we offer a long-term, financially rewarding career with unmatched earnings and growth potential. Our commissions are as high as 20%.

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This is a new position in CRAY RESEARCH Publication Department. It requires a person who can take charge of writing and producing a promotional computer marketing newsletter for public relations, distribution to potential customers on a quarterly basis. Review of draft articles submitted by employees to magazine journals or professional publications is required. Preparation of advertising materials is included in the function. The job requires technical level journalistic skills and communication skills that are necessary to work with field personnel and users. Creativity plus awareness of schedules important. A college degree in journalism or equivalent and 2 years of experience as an editor of a computer company newsletter is desired.

SYSTEMS PROGRAMMERS

CRAY RESEARCH is in the process of expanding its talented Programming Staff. We have openings for experienced Programmers. The positions include operating systems, development, maintenance and other challenging and interesting duties. These positions are located in the Twin Cities of Minneapolis and St. Paul, Minnesota.

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We currently have openings for talented computer professionals for assignment at several sites. Several years of experience on large scale computer systems is necessary. After several months training on the Super Scale Cray-I, the successful candidates will be assigned to a customer site.

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This person will be instrumental in all phases of developing courses for customers and employees. The instructor will develop peripheral courses and monitor students during their hands-on training period. The applicants should have a minimum of 2 years teaching experience and 2 years maintenance experience on large scale computer systems. Writing exposure is a plus. Location is Chippewa Falls, one of Wisconsin's most attractive and scenic recreational areas.

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The Product Manager is a key position in the Product Management and Support Department. This manager will be responsible for the development of the product and the market plans of CRAY RESEARCH INC. In-depth reports, refining marketing goals of the product, along with strategy for insured market acceptance is required in this position. The position requires an advanced degree in Business Administration or the equivalent. In addition, an undergraduate degree in Math, Physics, Computer Science or equivalent is highly desirable. Plus the ability to work with the technical people in understanding of scientific processes. Engineered confidence and cooperation are skills required for the Product Manager position.

In addition to highly competitive compensation and benefits package, you will be joining a highly successful and growing organization. Please submit resume and salary history in confidence to:

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BAI Limited is not an employment agency. We are Recruiting Consultants who specialize strictly in Data Processing Placement. Our clients pay all fees and expenses. To explore the EDP market professionally, confidentially, and effectively, call:

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Atlanta, Georgia 30303
(404) 581-0040

NEAT/3

PROGRAMMER/ANALYST

Minimum of 2 years experience in NEAT/3. Bank applications background desirable.

Exceptional opportunity with a dynamic fast growing Bank servicing company, located in the San Francisco Bay area.

Send resume care of:
Personnel Dept.
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So. San Francisco, CA 94080
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N.Y. N.C.C.

Take advantage of your visit to the NCC to meet with our recruiting staff. Our clients, from coast to coast, have listed many attractive situations with us. The demand for Data Processing professionals has never been greater in all of our 22 years in the field.

Evening interviews are available on Monday, June 4th and Tuesday, June 5th until 7:00 p.m. or later, by appointment. Ask at the front desk at the N.Y. Hilton for our suite number.

Even if you are not currently considering a career move, this is an opportunity to learn more about the computerized HALBRECHT EDP MANAGEMENT REGISTRY.

If you won't be attending the conference or just can't spare the time to stop by, we invite you to send a resume or call our New York office.

Some current client assignments include:

DIRECTOR, CORP. SYSTEMS (NYC Suburbs)	to \$45,000
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MGMT. CONSULTANTS (Midwest & Southeast)	to \$40,000
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New England Location

We are offering several challenging career opportunities for computer professionals who can meet our stringent qualification standards. Our Information Systems Department is expanding its professional staff in order to develop new systems for every major area of our business. This is a genuine ground floor growth opportunity for innovative systems development in a manufacturing environment. We are seeking a few creative, results-oriented individuals with demonstrated records of accomplishment.

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This position requires strong leadership, creative design and communications skills. The successful candidates will have a college degree and at least 3-5 years of solid business and systems design experience.

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A solid background in systems development, design and programming activities (COBOL or RPG) is required, in addition to a college degree and at least 2-4 years of experience.

Qualified candidates should forward their resumes, in confidence, to Wayne Louder, W.R. Grace & Co., 62 Whittemore Street, Cambridge, Mass. 02140.

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GRACE

PROGRAMMERS

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System Recovery
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- Compiler Design/Development
Interactive Symbolic
Debugging Systems
- Telecommunications Systems
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- Logic Design
- MOS Circuit Design

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NCR/SD is engaged in the design and construction of large-scale computer systems embodying powerful new concepts: virtual systems... firmware emulation... PASCAL-based OS language... VLSI technology... and other advanced developments.

The work we do has a strong impact on NCR's market position, provides high visibility for professional achievement, and offers experience in the new computer technologies that we are using to anticipate business EDP needs in the 80s.

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If you're planning to attend the NCC show at the New York Coliseum, June 4 through 7, Call Jack Gullette in New York at:
(212) 765-9359

for a full briefing on career opportunities that are listed.

To make an appointment with him in advance of the above dates, you may call him in San Diego at:
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Or send confidential resume to: Mr. George Rice, Manager, Professional Placement, Engineering and Manufacturing, Dept. F50, NCR Corporation, 16550 W. Bernardo Drive, San Diego, CA. 92127.

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PROGRAMMER

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programmers

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Qualified candidates are invited to direct their responses to Phil Beckhelm, Amdahl Corporation, 1250 East Arques Avenue, Sunnyvale, CA 94086 or call him toll free at 800 538-8460, ext. 6165. We are an equal opportunity employer.

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June 6th — 4PM

1133 Avenue of the Americas (43 St.)

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Geoffrey Frazier

YOURDON

YOURDON, INC.

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Data Processing

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Employment Specialist
Human Resources Division

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Positions require assembly language programming experience and familiarity with display terminal systems. Will participate in functional definitions, detail design, coding, and test and integration.

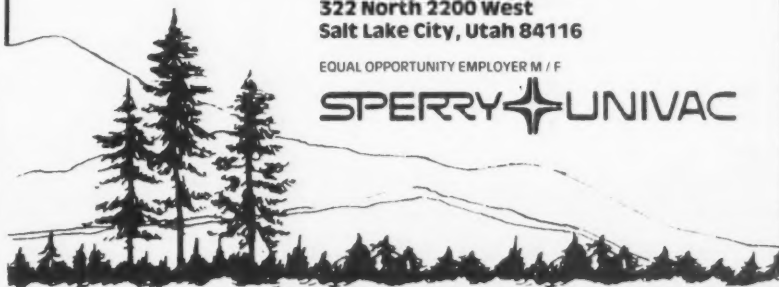
We offer an excellent benefit package consisting of: Comprehensive medical and maternity; Life, Dental and travel insurance programs; Retirement plan, Accident and sickness, sick leave and long-term disability (income protection); Paid holidays and vacation; Educational reimbursement; Company-sponsored training programs.

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Employment Department
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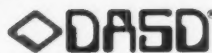
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Initial assignment will be to our Manhattan office with advancement opportunities available either in New York or in 20 other U.S. office locations.

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Please send your resume, in confidence, with salary history to: Mr. M.M. Levin, Dept. CW, 38th Floor, 345 Park Avenue, New York, New York 10022.
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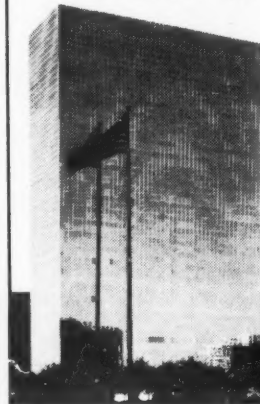
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FLORIDA

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Programming Department Manager

Or Write: Don Moman
Computer Systems Group
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Modular Computer Systems, Inc. (MODCOMP) is seeking creative, hard-working, and enthusiastic professionals to join our Software Development Division in the following positions:

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Qualified individuals must have prior experience in applying operating systems to real-time environments. In this position you will be responsible for I/O process control applications. Previous experience is essential in the development of process control languages, real-time operating systems, and/or data acquisition and control software. BSCS or EE is preferred.

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SENIOR OPERATING SYSTEMS SOFTWARE DESIGNERS

Opportunities exist to design and implement real-time, multi-tasking operating systems components. Individuals must have a minimum three years experience in operating systems software, including a detailed knowledge of computer architectures and familiarity with modern operating system design theory. BSCS or equivalent is preferred.

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As a Diagnostic Programmer, you will be responsible for developing stand-alone and on-line diagnostic packages. Functions include conceptual definition, project design, debugging and implementation. BSCS or equivalent is preferred.

These openings represent an excellent opportunity to join a growing leader in the computer industry. MODCOMP offers highly competitive salaries, career growth, and fringe benefits including a stock purchase plan, dental insurance, and relocation expenses. Besides, where else can you find beautiful beaches a few miles away, unlimited tennis courts, and golf courses in your backyard?

So, take some time today to investigate the state-of-the-art system software development activities at our company headquarters in sunny Ft. Lauderdale. If you qualify for any of the above positions, call toll-free or send your resume and salary history in complete confidence to:

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Programmer/Analyst
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Reed College, a private undergraduate four-year liberal arts College, with an enrollment of 1100 students has an immediate opening for a Computer Center Director with programmer/analyst skills.

Computer Center Director will have responsibility for operation of DEC PDP 11/70 Academic Computer running UNIX and IBM 1130 Administrative Computer.

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Director will be responsible for the design and programming of the conversion from the 1130 and the upgrading necessary to provide time-shared data retrieval and update capabilities. The Business Office, Registrar, Admission Alumni and Development systems are currently written in FORTRAN but the upgrades will be written in COBOL using multi-keyed ISAM files.

Director has total system responsibility and will be supported by an operations staff of two.

To be considered for this opportunity, detailed resumes including 3 professional references should be submitted to:

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Position requires three years ALC programming with a minimum of one year IBM 360/370 systems programming and CICS background. Individuals we seek should have strong interest in data communications.

We are located in Northern Virginia minutes from the Nations capital. We offer competitive salary and a comprehensive employee benefit program. Please send resume in confidence, including salary history, to the Employment Office, The Fairfax Hospital, 3300 Gallows Road, Falls Church, Virginia 22046. EOE M/F

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DATA SYSTEMS DIVISION

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MANAGER

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SCI, one of the sunbelt's fastest growing manufacturers of computer products, is looking for a Software Development Manager to manage applications software for our line of financial terminals and computer systems as well as corporate data processing.

The ideal candidate for this position would have management experience in a software development organization, a background in the banking industry and a knowledge of on line real time systems. In addition to a challenging and rewarding working environment, you'll enjoy the warm winters, cool summers and low cost of living in Huntsville, Alabama.

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Advertising

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Progressive electronics industry leader, headquartered in Minneapolis/St. Paul, seeks a seasoned communications professional to direct its creative advertising staff. Responsibilities will also include managing public relations and trade show programs.

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Responsible for the installation and maintenance of data processing equipment and related communications devices.
A degree in electrical/computer engineering or an equivalent combination of education and experience is required. Experience with IBM S/370 and DEC PDP-10 & PDP-11 is preferred.
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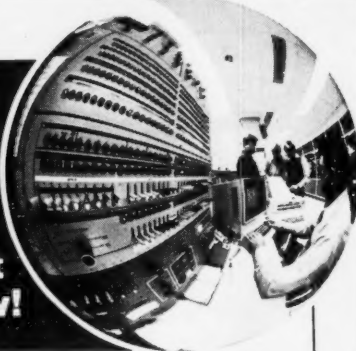
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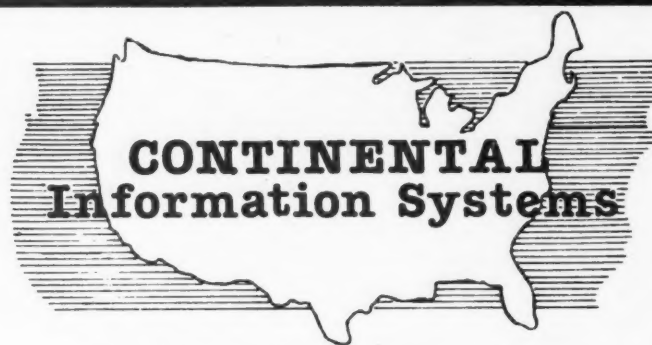
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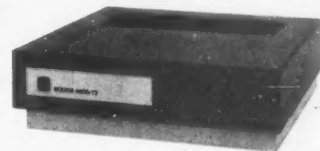
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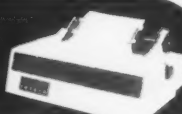
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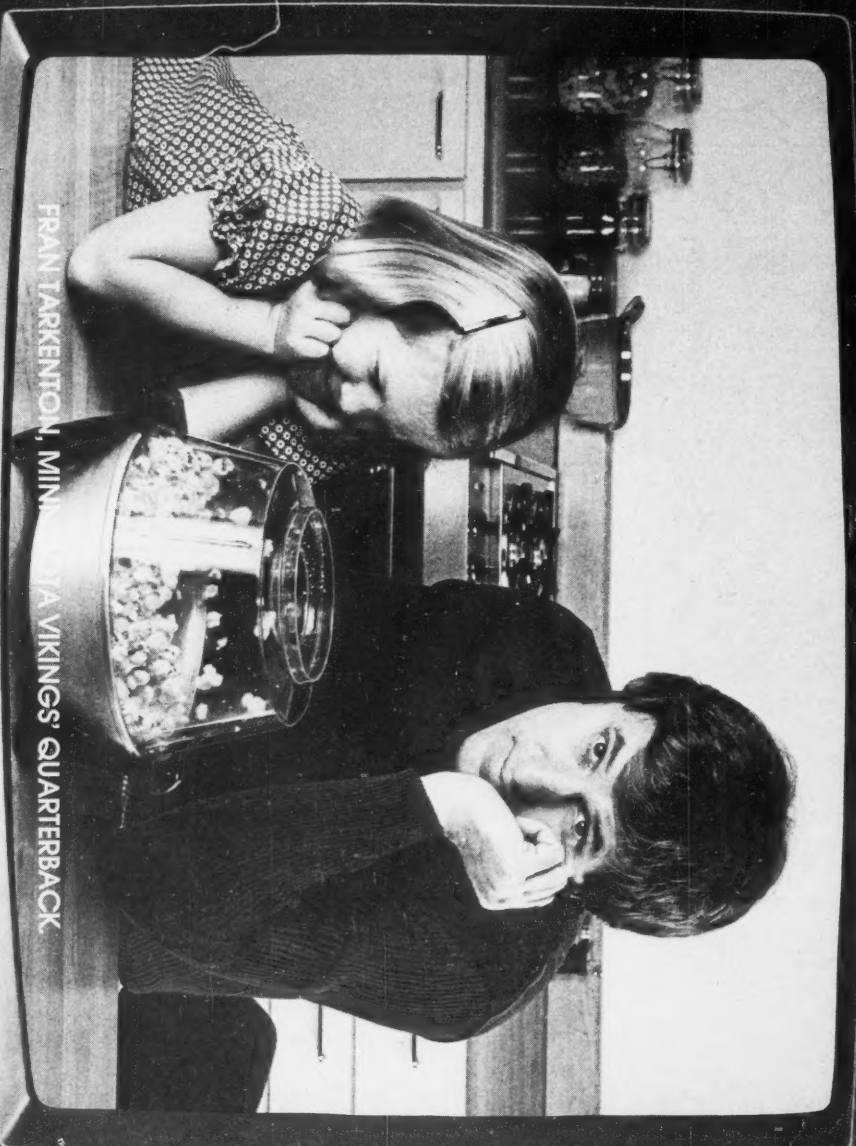
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